

Flight, July 9, 1910.

# FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

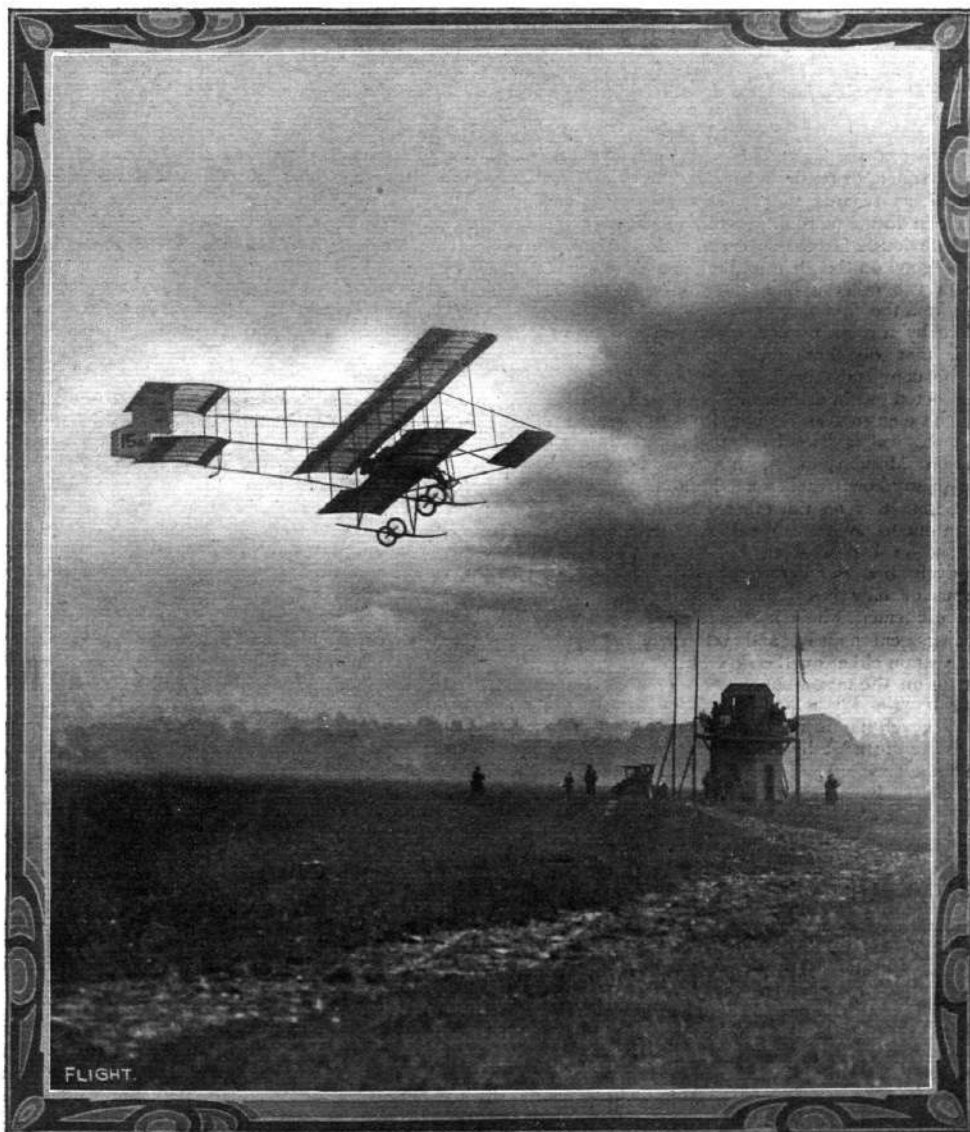
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MIDLAND NATIONAL MEETING.—Mr. Lancelot Gibbs making a fine flight on his Henry Farman during the gusty weather on Saturday evening last, the closing day of the meeting.

# BOURNEMOUTH, LANARK, AND A TREACHEROUS CLIMATE.

CONSIDERING how very much probably depends upon the popular success or otherwise of the two big international aviation meetings about to be held in the United Kingdom this year, it is quite sufficiently tantalising to have to realise how very greatly the rapidly-growing flight industry of this country is at the mercy of elements which, at the moment of writing, seem to be fully living up to their evil reputation of uncertainty and customary bias towards unpleasantness. Flying commences at Bournemouth on Monday, and thus begins the first British international meeting. Everything, moreover, as regards preliminary arrangements that can be done to ensure success has been done, and fortunately there is every reason to anticipate that the scene of the numerous contests which constitute the items of the programme is relatively free from the inherent natural drawbacks that have been encountered to such an annoyingly great extent at all other meetings held in England previously.

It is virtually impossible to claim with any certainty in advance that a particular flying ground is by nature admirably suited, or on the other hand, only indifferently well-suited, as regards the lay of air currents and of atmospheric disturbances in general. True, in exceptionally and obviously favourable cases, such as unquestionably hold good on the plain of Betheny, at Rheims, and in one or two other unique spots abroad, it has been obvious from the first that if success could be attained anywhere by aviators, except in the very calmest of still weather, that on those wide open stretches, ascents would be comparatively safe, and manœuvring could be conducted without serious risk of catastrophe, due to the elements as distinct from dangers resulting from mechanical faults. Until flight begins at Bournemouth on Monday, it is, however, impossible for anyone to say how treacherous the atmosphere may be or what immunity on the other hand it may by good luck turn out to possess. We do not, of course, refer to mere good or bad weather, but rather as to whether in relatively bad weather flight is rendered entirely dangerous or only has imparted to it that degree of healthy excitement which increases the interest of the proceedings enormously, and yet does not put too serious a strain either on the skill and experience of the aviators or on the maximum strength of their machines. Everything primarily must depend, of course, on the weather, though its precise effect is, as we have just said, influenced quite a lot by the natural lay of the land in the immediate vicinity.

One extremely important reason why the differences between place and place from a flying point of view ought to be recognised as widely as possible just at the present time, is because even during the past week the newspaper-reading public—which to-day means everybody—will have observed the altogether unfortunate extent to which the national meeting at Wolverhampton has been marred, and the comparatively small degree to which the international gathering at Rheims has been converted into anything in the nature of a failure. Fortunately, the British daily Press has made it clear that there is nothing in this which is in any way derogatory either to the pluck or to the skill of the British airman, so that already a very proper line has been taken by those who help to mould public opinion, and a certain amount of allowance has been made even by the "man in the

street" for the natural advantages that are at present favouring very greatly the foreigner.

What we chiefly wish to emphasise on the present occasion is that because this country is bound in the early stages of the aeronautic industry to suffer to some extent by its climatic and geographical handicaps, it therefore behoves everyone to help make the very best that it is possible to make out of Bournemouth next week, and out of the other international meeting at Lanark next month, by seizing upon all that turns out to be most favourable to each of those meetings, and making the very most that is possible out of them.

Speaking more particularly of Bournemouth for the moment, it is rather unfortunate that comparatively few of the Continental flying men have found it possible to attend, partly owing to the nearness with which the meeting there joins up in the matter of dates with that at Rheims. On the other hand the enthusiasm that is bound to be engendered in any case owing to the many other features of the Centenary Fêtes, of which the flying forms a part, is certain to bring enormous crowds into the vicinity. Given reasonably fair weather—and even if we cannot be over hopeful there is at least no reason for despondency—there are ample attractions going on down there to make it well worth while for all who can afford the time to journey thither, and hence it almost becomes the duty of British readers of *FLIGHT* living anywhere south of the Midlands to foregather at Bournemouth on Monday next and to put in as much of the whole week as they can spare from their other actual and more peremptory duties.

Similarly, we would take this opportunity of urging everyone who can to go to Lanark next month for the flying week there. All readers must have observed the exceptionally energetic and enterprising manner in which the Lanark meeting has for some little time been brought prominently before all the inhabitants of the United Kingdom from John o' Groats to Land's End, and hence it is perhaps almost redundant to remark that they may at least rely upon the Lanark executive for conducting the programme in a thoroughly businesslike manner, and in thoroughly satisfying every individual member of the public. The Lanark ground, like that at Bournemouth, although as yet untried on any extensive scale, is regarded as being full of promise for the purpose in view, and therefore it is to be hoped that the meeting there, like that of next week at Bournemouth, will prove to be less influenced by adverse climatic conditions than has been the case during the week that has passed at Wolverhampton.

These climatic handicaps of British airmanship need, as we have endeavoured to point out above, to be kept well to the fore as regards recognition during these comparatively early days when their disadvantages are at their height. It is at the same time, however, encouraging to remember that these very handicaps of which we speak are pretty sure ultimately to cut quite the other way, for in just the same way that British seamanship has always been able to boast its superiority, due largely to the extra wildness of the elements in the neighbourhood of our coasts, so a few years hence it is more than likely that the manufacturers who build, and the men who fly British aeroplanes will find that they can more than hold their own with any machines or with any airmen to be met in any other part of the world.

## FLIGHT PIONEERS.



MR. CECIL GRACE.

# GREAT BRITAIN'S FIRST 1910 INTERNATIONAL MEETING.

ALL who are interested in aviation in Great Britain will turn their thoughts to Bournemouth during next week, where the first international flying meeting of the year on British soil opens there on

Monday. Owing to the meeting following so closely on the Rheims fixture, the foreign contingent will not be large, consisting, in fact, as our readers are already aware, of only four aviators, three of



**BOURNEMOUTH FLIGHT MEETING.**—British aviators who have entered for this International gathering. Of the above the following also were flying at the Midland National Meeting at Wolverhampton last week:—Messrs. Alan Boyle, Grahame-White, Rolls, Barnes, Cecil Grace, Rawlinson, Lancelot Gibbs, Radley, and Ogilvie.

whom, Audemars, Morane, and Hanriot, rely upon monoplanes, while Christiaens uses a Henry Farman biplane. The full list of entries and the machines they fly is as follows:—

1. Edouard Audemars (Demoiselle)
2. G. A. Barnes (Humber)
3. Hon. Alan Boyle (Avis)
4. — Christiaens (H. Farman)
5. G. B. Cockburn (H. Farman)
6. S. F. Cody (Cody)
7. G. C. Colmore (Short)
8. Capt. Bertram Dickson (H. Farman)
9. J. Armstrong Drexel (Blériot)
10. L. D. L. Gibbs (H. Farman and Sommer)
11. Cecil Grace (Short)
12. C. Grahame-White (H. Farman)
13. Robert Jones (H. Farman)
14. J. T. C. Moore-Brabazon (Short and Voisin)
15. Leon F. Morane (Blériot)
16. A. Ogilvie (Short-Wright)
17. James Radley (Blériot)
18. A. Rawlinson (H. Farman)
19. Hon. C. S. Rolls (Short-Wright)
20. Louis Wagner (Hanriot)

From this it will be seen that twelve of the sixteen British airmen favour the biplane, of which half are of the Henry Farman type.

With regard to the aerodrome, this has been specially prepared for the meeting, and the general arrangement of it can be gathered from the plan which we reproduce. It is situated at Southbourne, some distance to the east of Bournemouth beyond Boscombe, but it is very accessible, as it is served from Bournemouth by an excellent service of electric trams which cover the distance in about twenty minutes. The arrangements and charges for the various stands are also clearly shown on the plan.

In the work of preparing the ground about three miles of hedges and earth banks had to be removed, and something like forty small vegetable allotments were expunged, their owners being duly compensated. As it is now, the aerodrome presents the appearance of a natural basin but very level and extending about two miles from the main road to the coast. The circuit of the course is a little under two miles, and the longest straight is nearly a mile in length.

In order to give spectators a view of the sea flights, Christchurch Head, a natural landmark rising above the cliff, has been secured, and transfers will be issued at a fee from the various enclosures to this vantage-point.

Altogether a sum of £8,500, besides medals, is to be distributed in prizes during the week. In the principal competitions there will be four prizes, as follows:—

- Longest flight—£3,000, £150, £60, £40.
- Speed flight—£1,000, £400, £100, £50.
- Greatest altitude prize—£1,000, £400, £100, £50.
- Starting prize—£250, £50, £25, £25.
- Alighting prize—£250, £50, £25, £25.
- Sea flight (three prizes) (for best time) £800, £400, £100.

- Weight carrying (three prizes)—£350, £150, £50.
- General merit (four prizes)—£500, £300, £150, £50.
- Slowest circuit (one prize)—£100.
- Competitors' assistants (two prizes)—£60, £40.

The *Daily Telegraph* will present a magnificent silver cup to the British aviator giving the best exhibition on any machine.

The following is the programme for each day:—

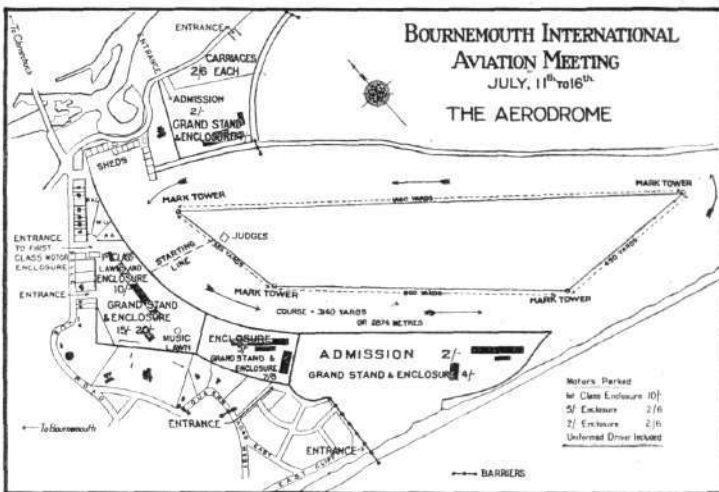
**Monday, July 11th.**—Longest Flight, Speed Prize, Altitude Prize, Slowest Circuit.

**Tuesday, July 12th.**—Longest Flight, Speed Prize, Starting Prize, Alighting Prize, Slowest Circuit.

**Wednesday, July 13th.**—Longest Flight, Speed Prize, Altitude Prize, Weight Carrying, Slowest Circuit.

**Thursday, July 14th.**—Longest Flight, Speed Prize, Weight Carrying, Starting Prize, Alighting Prize, Slowest Circuit.

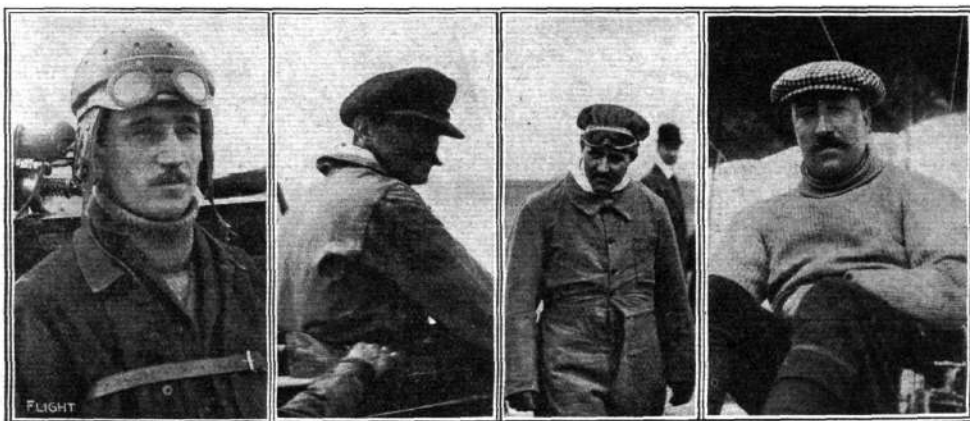
**Friday, July 15th.**—Longest Flight, Speed Prize, Altitude Prize, Sea-Flight round the Needles (weather permitting), Aeroplane v. Motor Boat Race.



The course—3,140 yds.—for the flying is denoted by the four mark towers, the four sides measuring respectively, commencing with the side facing the chief Grand Stands where the starting line is, 350 yds., 880 yds., 450 yds., and 1,480 yds.

**Saturday, July 16th.**—Longest Flight, Speed Prize, Altitude Prize, Sea-Flight round the Needles (weather permitting), Aeroplane v. Motor Boat Race.

Official flying hours are 11 a.m. till sunset.



M. E. Audemars.

M. L. Wagner.

M. L. F. Morane.

M. Christiaens.

FOREIGN AVIATORS FOR BOURNEMOUTH WEEK.

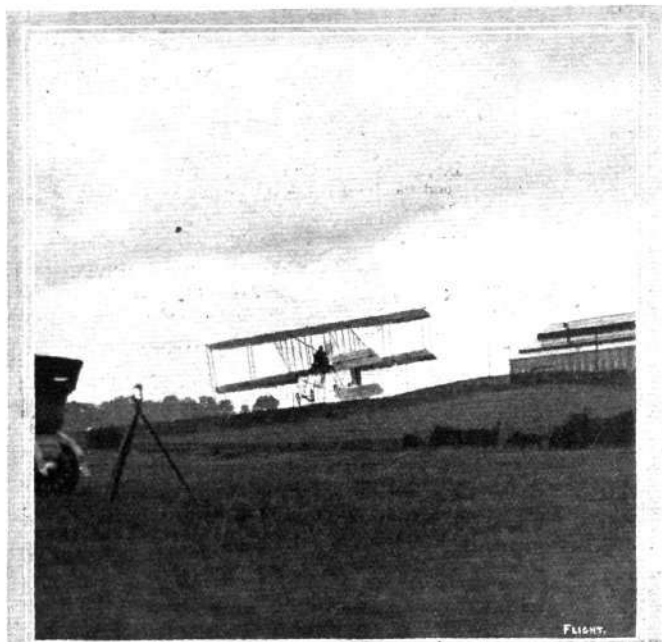
## MIDLAND NATIONAL MEETING.

WHEN the Midland Aviation Meeting closed on Saturday evening last, there were six competitions which had to be withdrawn by the

White. By virtue of its situation the Dunstall Park Racecourse by no means makes an ideal aerodrome, and added to that the aviators had to contend with disheartening weather conditions. In spite of all these adverse circumstances, however, the meeting proved to be very interesting, and emphasised the fact that there is now a sufficient number of proficient British flyers to run such a meeting without having recourse to the foreign schools.

Last week we were able to give details regarding the proceedings on the first days of the meeting, and recorded the win of Mr. Cockburn in the "get-off" competition, as well as the evening flight of Mr. Cecil Grace. This was the most spectacular performance of the meeting. Rising from the ground on his Short biplane, while the "get-off" competition was in progress, Mr. Grace was soon at a height of between 500 and 600 ft. He flew in gradually widening circles, and at one time was over Tetterhall, while at another time he was flying out towards Bushbury. After flying thus for some time he gradually reduced his altitude to 150 ft., when, shutting off the engine, he planed down to the ground, landing safely in the centre of the park, after being in the air for 27 mins. 45 secs. While Mr. Grace was in the air Mr. Grahame-White started off and rose to a height of between 200 and 300 ft.; but his engine did not appear to be working well, and so he descended after a quarter of an hour. During his flight Mr. Grace was continually cheered, not only by the people in the aerodrome but by the crowds which assembled at various vantage points at Tetterhall, Bushbury, Bilston, Willenhall and Sedgeley. During the day Mr. Rawlinson made a flight of seven minutes, and the Hon. C. S. Rolls and Mr. J. Radley each completed one circuit of the course.

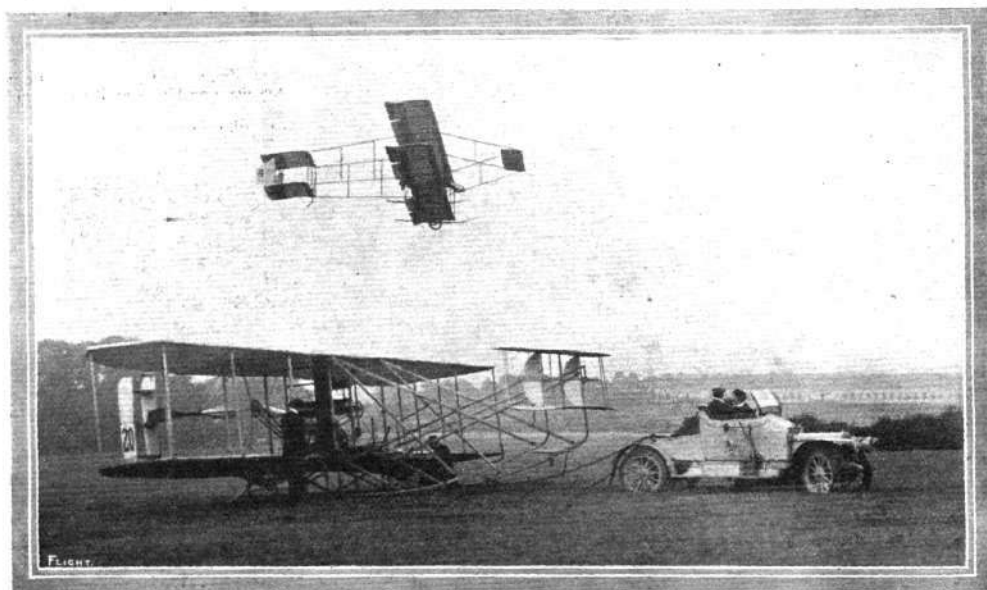
On Thursday morning weather conditions were against aviation, but at noon the wind moderated considerably, and the white flag indicating that flights were probable was hoisted. A sudden change in the wind and showers of rain quickly put a different aspect on affairs. At a quarter to eight, however, another change took place, and Mr. Radley brought out his monoplane, to be quickly followed by the Hon. Alan Boyle



Mr. Rawlinson during one of his flights at Wolverhampton last week on his Henry Farman machine.

judges, and the greatest cumulative time spent in the air during the week was one hour and a quarter to the credit of Mr. Grahame-

White. By virtue of its situation the Dunstall Park Racecourse by no means makes an ideal aerodrome, and added to that the aviators had to contend with disheartening weather conditions. In spite of all these adverse circumstances, however, the meeting proved to be very interesting, and emphasised the fact that there is now a sufficient number of proficient British flyers to run such a meeting without having recourse to the foreign schools.



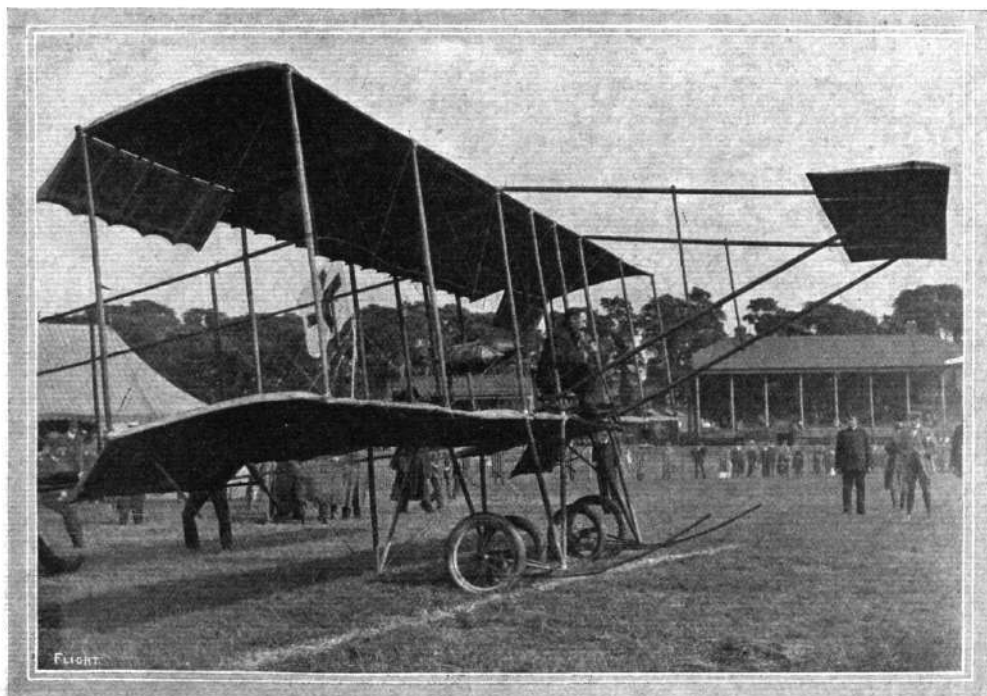
Mr. Claude Grahame-White, on his Henry Farman at Wolverhampton, flying over Mr. Ogilvie's Wright machine, which is being towed back to the starting place.



SOME OF THE BRITISH AVIATORS WHO SUPPORTED THE MIDLAND NATIONAL MEETING AT WOLVERHAMPTON LAST WEEK.

Other flyers at this meeting, who are also taking part in the Bournemouth Meeting next week, appear on page 516. Mr. G. B. Cockburn will also be at Bournemouth.

and Mr. Grahame-White. Each completed a circuit or two of the ground, and then Graham Gilmour started off in the longest flight competition. He only completed a circuit and a half, and then landed.



One of the most interesting items on the programme of the Midland Meeting at Wolverhampton was the "Quick-rising" Competition. In our photograph Mr. Cockburn, the winner of this contest, is seen on his Henry Farman "toeing" the starting line for one of these trials.



Another "passing" incident during the Midland National Meeting.—Mr. Grahame-White flying over one of the Blériot monoplanes.

Then Mr. Gibbs brought out his Farman biplane and rose to a good height, but apparently finding the current not quite suitable he dropped to a lower altitude. Meanwhile, Mr. Grahame-White and Mr. Grace had also started, the latter rising to 400 ft., while Mr. Grahame-White went 100 ft. higher. Both Mr. Gibbs and Mr. Grahame-White flew for half an hour, but Mr. Grace came down after 24 mins. 11 secs., as his machine needed a slight adjustment. Mr. Alec Ogilvie tried to start, but did not properly leave the ground, whilst the Hon. C. S. Rolls and the Hon. Alan Boyle each were up for a little over a minute.

Early on Friday morning the flying prospects seemed to be good, but as the day wore on the wind increased in strength, and it was not till a quarter to seven that the conditions were considered favourable for flying. Mr. Alec Ogilvie was the first to get away, but he came down after only 43 secs. He was followed by Mr. Radley and the Hon. Alan Boyle, but neither were in the air for more than a minute. Mr. Grahame-White also made a one-minute flight, and as the conditions were not favourable to long-distance flying the aviators contented themselves with an impromptu "get-off" contest, much to the gratification of the spectators.

On Saturday, the last day, there was a good deal of work done, although it was not till half-past five that flying was commenced in earnest, the best trials being made between seven and eight o'clock. The contest of the day was for the speed prize, which was won by the Hon. C. S. Rolls, who hugged the corners of the course very closely, and so saved time on the Farman machines of Messrs. Grahame-White and Gibbs. The lap times are shown in our table. Late in the evening Mr. Grahame-White took Lady Muriel Paget, Lady Scott, wife of the Arctic explorer, and several of the officials for short trips on his machine. Mr. Grace and Mr. Ogilvie both had mishaps and damaged their machines, as also did Messrs. Radley, Barnes, Graham Gilmour, and Gibbs. The last-mentioned complained that his machine caught the currents from the other planes above him, which forced him suddenly to the ground. Mr. Grahame-White made a half-hour flight for the longest distance prize, and thus made his position as the winner secure, as his nearest opponents, Messrs. Grace and Gibbs, were out of the competition.

Thus ended the first British national meeting, for the success of which all the officials had worked with one accord, and in the face of the most adverse weather conditions.

The following are the results of the competitions that were carried through:—

### The Duration Competition (Biplanes).

Mr. C. Grahame-White...	1h. 15m. 38s.	1st prize £1,000
Mr. L. D. L. Gibbs ...	1 13 5	2nd ,, 200
Mr. Cecil Grace ...	0 55 43	

The Committee decided to make the monoplanes a class by themselves, and therefore offered additional prizes to the value of £350. The results were:—

Hon. Alan Boyle ...	7m. 53s.	1st prize £200
Mr. J. Radley ...	7 51	2nd ,, 100
Mr. Graham-Gilmour ...	7 5	3rd ,, 50

### The Midland Prize.—Two competitors only entered, viz.:

Mr. G. Barnes ...	1m. 17s.	1st prize £200
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Mr. Francis failed to cross the starting line in flight, and the second prize of £100 was therefore not awarded.

### The Greatest Height.—The results were:—

Mr. Cecil Grace, 600 ft.	Mr. Grahame-White, 197 ft.
Mr. L. D. L. Gibbs, 116 ft.	

Mr. Grace was awarded the Trophy given by Sir John Holder.

### Lord Plymouth's Prize for the Three Fastest Laps.

	1st Lap.	2nd Lap.	3rd Lap.	Total.
Hon. C. S. Rolls...	1m. 28s.	1m. 21s.	1m. 24s.	4m. 13s.
C. Grahame-White	1 37	1 36	1 35	4 49
L. D. L. Gibbs ...	1 35	1 40	1 40	4 56

The Shortest "Get-Off."—Prize, £100. Each competitor was allowed three trials.

Name.	1st Round.	2nd Round.	3rd Round.
Cockburn (H. Farman) ...	143½ ft.	174 ft.	100½ ft.
Rawlinson (H. Farman) ...	—	204½	—
Barnes (Humber) ...	176½	—	—
Grahame-White (H. Farman)	120	101	107
Gilmour (Blériot) ...	212½	—	—
Radley (Blériot) ...	158½	257½	—
Gibbs (H. Farman) ...	105½	—	—

The Hon. Alan Boyle and Mr. Cecil Grace did not fulfil the conditions of the prize. The prize of £100 was therefore awarded to Mr. Cockburn. On a subsequent occasion, when the weather was not fit for flying, a "Shortest Get-Off" competition was arranged, and Mr. Grahame-White succeeded in getting off in 77 ft.

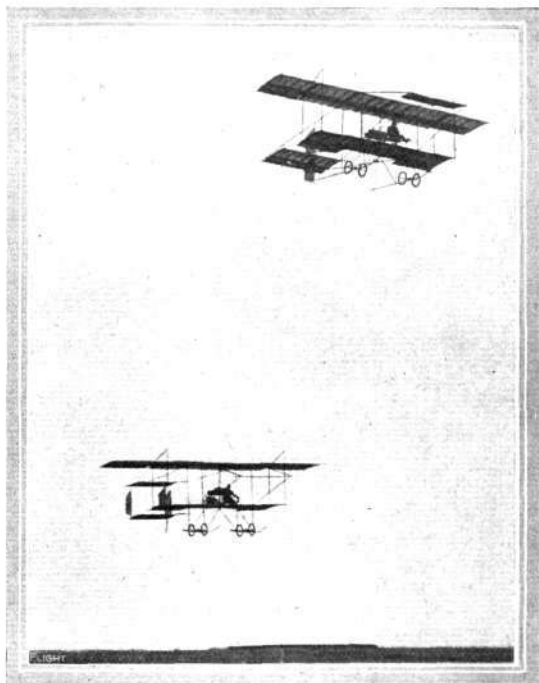


Captain J. H. Cooke, Chairman of the Council of the Midland Aero Club, who has been largely responsible, in conjunction with Mr. W. Ivy-Rogers, the Hon. Sec., for the admirable arrangements and conduct of the Midland Aviation Meeting at Dunstall Park last week.

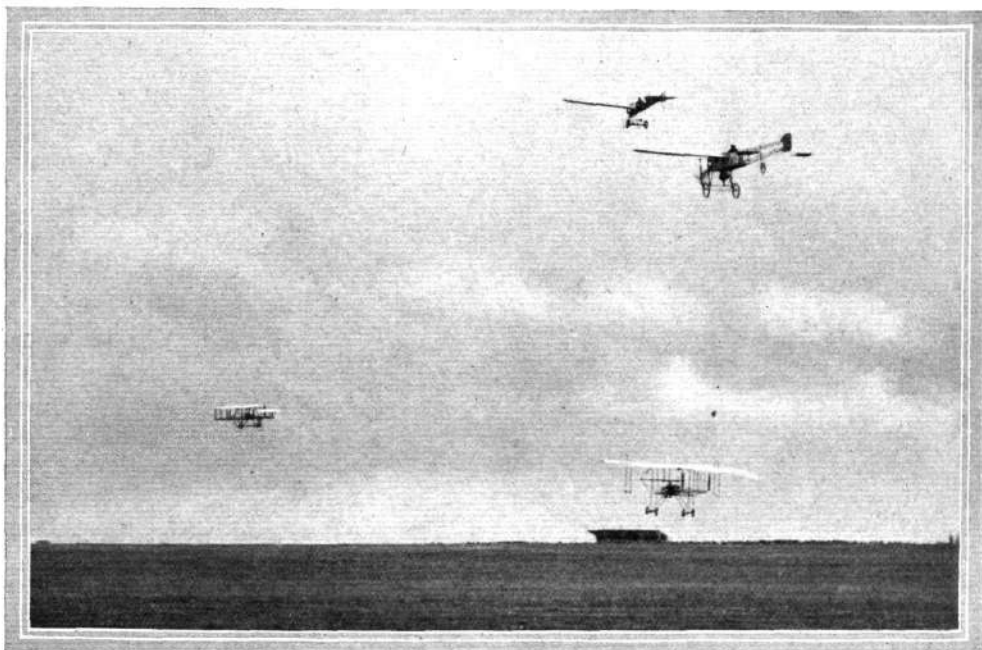
## THE 1910 RHEIMS WEEK.

JUST as the great Rheims meeting last year showed in a most emphatic manner how much progress had been made during the few preceding months, so the meeting which opened on Sunday last illustrates how rapid has been the advance since then. A year ago it was considered wonderful to see half-a-dozen machines in the air at one time. Now the sight of three times that number flying at one time may be witnessed with equanimity, and it was anticipated by some very sanguine folk that at some time during the week there might be as many as 36 of the 76 competing machines in the air simultaneously.

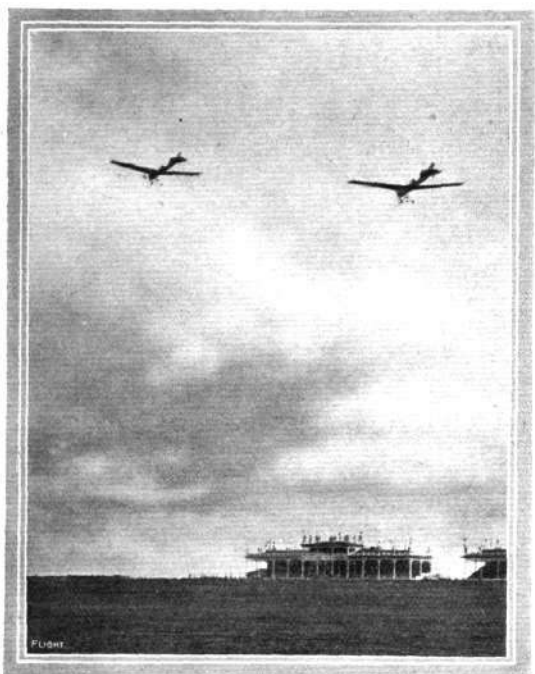
On the opening day, Sunday last, the general enjoyment of the proceedings was overshadowed by the unfortunate fatal accident to M. Wachter, which occurred at the close of the day. He had been flying round the ground steadily for some time, and had covered about 60 kiloms. He was coming down from a height of about 900 ft. when, on reaching an altitude of 600 ft., the wings of his machine doubled up and the machine dropped like a stone to the ground, the unfortunate aviator being killed on the spot. He was related to M. Levassieur, the designer of the machine, with which he had been very successful. He it was who had the honour of opening the meeting this year, for he was the first aviator to rise, about ten minutes past eleven. The weather conditions then were anything but good, yet he remained up for 43 minutes and completed nine circuits of the 5 kilom. course. Then a heavy rainstorm put an end to flying till the afternoon. Between two and four o'clock there were a large number of different machines—fourteen at one time—circling the ground at various heights, the best showing being made by the Antoinettes, which seemed to weather the gusty winds better. Another heavy shower, which lasted a quarter of an hour, came on, and sent most of the flyers back to their sheds, but Wachter kept on, and it is thought that the drenching his machine then got may have contributed to the subsequent mishap. Following the storm a rainbow stretched across the ground, and produced a pretty effect, with the number of flyers who immediately came out again. Latham and Morane competed for the height prize, and although the former was content with 566 metres, Morane went up to 862 metres. The longest single flight during the day was 87 kiloms. by Tetard on a Henry Farman machine, the next best being 75 kiloms. by Olieslaegers on a Blériot, and 64 kiloms. by Lindpaintner on a



A brace of Henry Farmans racing at Rheims Aviation Meeting on Sunday last.



A GROUP OF FOUR FLYERS IN THE AIR AT ONCE AT RHEIMS.—Above, an Antoinette and a Blériot; below, a Henry Farman; and, to the left, a Wright machine.



REAL RACING IN THE AIR.—A "neck and neck" race at Rheims Meeting on Sunday last, the opening day, between Wachter, who unfortunately was killed later, and Thomas.



## THE WRECKED "DEUTSCHLAND."

AFTER the accident to the Zeppelin aerial liner, recorded in our last issue, the dirigible was dismantled, and the various parts, such as the motors, the cars, &c., were packed on to railway trucks and returned to Friedrichshafen. They will there be utilised in the work of reconstructing the airship, which it is hoped will be ready to resume her voyages in the autumn. A good deal of the great framework is undamaged, and can be used again, as also can a greater part of the envelope. The parts of the great aluminium frame which are unusable will be melted down and recast. The work of dismantling was undertaken by a draft of 250 men from the Muenster Barracks, who first cut down the trees all round the airship, so allowing it to settle down into the shelter of the forest. Then the cloth covering of the airship was cut away in sections and rolled up, and afterwards the aluminium skeleton was dissected piece by piece, so that in a very few hours little remained recognisable of the aerial liner which had left Dusseldorf so proudly on the previous morning.

Lieut. Wagner, the first officer of the "Deutschland," attributes the accident to a combination of adverse circumstances, and not to any fault of the system. The chief cause was the downward whirlwind, but if the petrol had held out the vessel would have weathered the gale. As it was, she was at the mercy of the elements. According to the recording instruments, the airship just previous to the accident was at an altitude

Sommer. For the totalisation prize the unfortunate Wachter was credited with first place, his record being 142'625 kiloms., Weyman on a Henry Farman being second with 139'75 kiloms., and Olieslaegers third with 109 kiloms. Altogether two dozen aviators made flights of varying lengths during the day.

On Monday afternoon a strong wind prevented any flying, but one or two of the aviators indulged in a few rounds during the morning, while in the evening nearly all the machines were out for an airing. The proceedings were given a spectacular effect by the flashes of lightning which occasionally lit up the horizon. A fine spectacle was a race between Latham and Olieslaegers, the former flying for 105 kiloms., while the latter stopped after flying 20 kiloms. short of this. Competing for the speed prize, Morane, on his Blériot, covered the 10 kiloms. in 6 mins. 48 secs., and the five kiloms. in 3 mins. 15 secs., both times being better than the world's records. A number of machines met with disaster, although the aviators, with one exception, escaped injury. Martinet, Bathiat, Aubrun, Mumm, Frey, Cheuret, Thomas, Daillens, and Weyman all brought their machines down with a crash, in some cases through the "wash" of other machines affecting them. Martinet was the most seriously hurt, he sustaining internal injuries.

Tuesday was fixed for the French eliminating trials for the Gordon-Bennett Aviation Trophy, and as a result three monoplanists, Leblanc, Latham, and Labouchere completed the 100 kiloms., and qualified to represent France in the race. In the course of this trial Leblanc reduced the record for 5 kiloms. to 3 mins. 10½ secs., and for 10 kiloms. to 6 mins. 27½ secs. His time for the 100 kiloms. was 1h. 19m. 13½s., and the following records were also beaten en route:—50 kiloms. in 39 mins. 50½ secs., 60 kiloms. in 45 mins. 26½ secs., 70 kiloms. in 53 mins. 32½ secs., 80 kiloms. in 1h. 2m. 22½s., 90 kiloms. in 1h. 11m. 5½s. Latham's time was 1h. 24m. 58½s., while Labouchere took 1h. 25m. 24s. For the greater part of the distance Labouchere was racing against Latham, with Wagner on the Hanriot monoplane as a pace-maker. For the daily height prize Latham ascended to an altitude of 500 metres, and then darted off in the direction of Rheims, returning to the flying ground after circling above the town. Three Blériot pilots, Morane, Aubrun and Olieslaegers, also went up for the height prize, but only the first-named bettered Latham's figures. Morane's height was 530 metres, from which altitude he planed down to earth, while the other two monoplanes did not go higher than 400 metres.

of 1,300 metres, and in rising so high a lot of gas was lost. Then during the storm the envelope became much heavier through being drenched with rain, and thus there was a great loss of buoyancy.



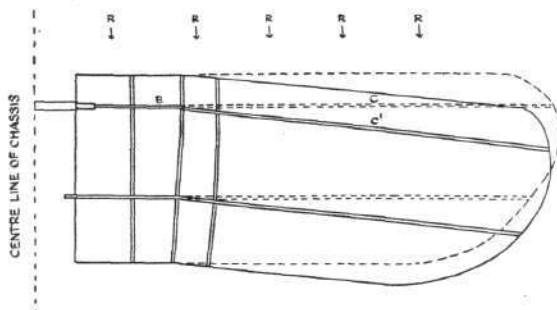
Remains of the Zeppelin dirigible, "Deutschland," which, as recorded last week, came to grief in the Teutoburger Wald.

## HEAD RESISTANCE.

### HAS IT BEEN THE CAUSE OF MONOPLANE DISASTERS?

By R. F. MACFIE.

MONOPLANES have been somewhat unfortunate in that the more sensational of the comparatively few fatal accidents have taken place with them, and the public are very naturally led to inquire if there is any factor that has been overlooked in the construction of this type of machine. For my own part I am of the opinion that there is, for I believe that designers of monoplanes have not given sufficient attention to the stress on the main spars of the wings that is induced by direct head-resistance. Inasmuch as the aeroplane flies nearly edge on, it is commonly supposed that the head-resistance on the spars is more or less negligible, but my own investi-



gations, and some little experience in the design and construction of an experimental machine, have led me to the contrary conclusion.

Many theories of the cause of the fatal accidents to Delagrang and Le Blon have been advanced, but none of them have, to my mind, been convincing, for I was an eye-witness of the former disaster, and feel sure that the failure was neither due to the gyroscopic action of the rotary motor nor to any region of aerial disturbance. It was a melancholy good fortune, too, that enabled me to be able to make an examination of the wreckage of this machine immediately after the accident, and before it had been tampered with by the public, and from this inspection I satisfied myself that although the left wing was broken off about 2 ft. from the body, yet all the stays and connections of the wings on the under side were in sound condition, and that it was not due to any failure on their part that the wing collapsed.

I had, as a matter of fact, explained my views on what I consider to be an inherent weakness in monoplane design to several experts prior to any serious accident with such machines, but it was generally received with scepticism, and I therefore thought it best to wait until I had collected something in the nature of practical evidence. The Delagrang smash seemed to uphold my view, but still more convincing evidence was afforded one day at Huntingdon,

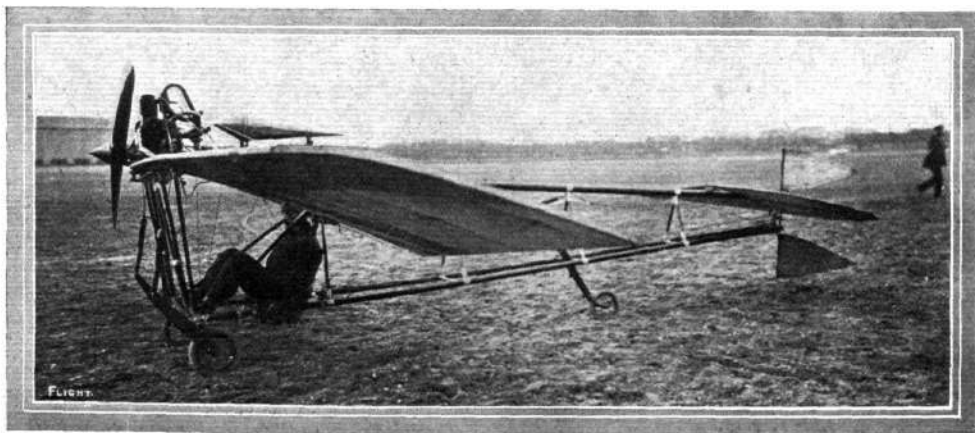
on May 10th, when Mr. J. Radley met with an accident of a similar nature from which he escaped unhurt.

Mr. Radley was flying at a height of 50 ft. from the ground when the machine suddenly executed a cork-screw glide, curving to the right from the aviator's point of view. It was found that the transverse arms of the right wing were both cracked for a distance of about two feet from B to C (see sketch). The after spar was badly twisted as well as split, and the whole wing was bent back from B to C', as it is here illustrated. In the sketch the dotted line shows the original shape of the wing, and the full line shows its shape after the accident. Mr. Radley is positive that this buckling took place in mid-air, and was not caused by the shock of landing.

My explanation of the failure is as follows: The wings of a monoplane constructed on these lines largely depend for their cross-bracing on the fabric itself, and it is not difficult to suppose that the head-resistance, represented by R in the sketch, is capable of straining the wing when it is remembered how great the leverage is through which it operates. The head-resistance, it must be remembered, includes skin friction and possibly a fraction of the aerodynamic resistance if the angle of incidence is considerable. In any case it is quite reasonable to suppose that the head-resistance represents a considerable portion of the total thrust, although it is difficult to say how much that amount is for any given machine. I have, as already mentioned, always believed that more attention ought to be paid to the matter, and to my mind the evidence that I have collected is proof of my contention, for I certainly think that the head-resistance is capable of severely straining the main spars, and of causing them to crack or fracture in extreme cases.

Another very important point that deserves to be investigated is the influence of a possible toggle action between the spars and their guy wires, which may in some cases augment the effect of the stress. It will be remembered that there was considerable discussion as to why the Delagrang accident could have taken place apparently as the result of fitting a rotary engine, and many people supposed that gyroscopic action had something to do with the matter. It will be recollected, however, that the reason why the rotary engine was used was because it gave greater power, and, therefore, made a higher flight speed possible. This increased velocity would increase the head-resistance, and since the resistance in the direct air increases as the square of the speed, a comparatively slight increase in velocity would be sufficient to account for a considerable augmentation of the pressure, which, it seems to me, the wings were unable to withstand.

In principle it is not desirable to emphasise anything in the nature of a fault without offering a remedy, and if I may be permitted to make the suggestion it is that most modern monoplanes would be improved in this respect by bracing the rear spars direct to the bows of the main frame by means of one or more diagonal wires beneath the wings, or the front spars to a bowsprit. This would enable some of the head-resistance to be taken by a member in tension, and would tend to relieve the bending strain.



The new French monoplane, "Montgolfier," with Lieut. Bier in the pilot's seat, who has recently been making some successful flights with this 25-30-h.p. Anzani-engined machine.

# AIRSHIPS AND WIRELESS TELEGRAPHY.\*

By H. THURN.

NOT long after the invention of wireless telegraphy it was proved by Prof. Slaby, in conjunction with the Prussian balloon corps, that wireless signals emitted by a land station can be received by a balloon floating freely in the air. Similar experiments have since been made in various countries. The balloon, "Condor," which made an ascent near Brussels last year, maintained uninterrupted communication with the station on the Brussels Palais de Justice, and also caught signals sent from the Eiffel Tower in Paris.

Prof. Hergesell, the protagonist of practical aeronautics, had already demonstrated the great value of the application of wireless telegraphy to balloons by controlling the valves of unmanned sounding balloons, at heights extending to ten miles, by wireless electric impulses. The receivers of the balloons were tuned to different wave lengths, so that the valve of any one balloon could be opened, and that particular balloon brought down at will.

The plan of communicating with passing airships by means of optical and acoustic signals has never been carried into effect, because the zone of communication is very limited, and the communication would necessarily be restricted to a few scraps of information, as the compilation and the study of a comprehensive code of signals would be very tedious and difficult. The system of signalling by flags, which is used by ocean vessels, would require the maintenance of signal stations at short distances apart, and the rapid passage of the airships would not give time for extended communications. The adoption of wireless telegraphy would obviate all of these difficulties, and would do away with the uncertainty which forms so serious an obstacle to the regular employment of aerial vehicles.

A reliable method of uninterrupted communication with the earth is absolutely necessary for the establishment of practical aerial transit. This communication is necessary for the safety of the airship and the development of its highest value as an instrument of sport, traffic, or military service; for the reception of information from military scouting balloons, for the direction of the aeronaut at night and in foggy weather, and for giving him warning of approaching storms and weather changes. An airship provided with wireless transmitting apparatus could also call for assistance when in distress, give notification of its probable time of arrival in port, and forward a statement of the men and material needed for repairs.

The radius of action of a military scouting airship would be doubled by the adoption of wireless telegraphy. In a series of experiments made with the German Army balloon, "Gross II," in the autumn of 1908, messages were successfully sent from, as well as to, the airship. This first of balloon wireless telegraph stations was constructed according to the "Telefunken" system. It was proved by preliminary experiments in the balloon shed, that the danger of igniting the contents of the gas-bag by the sparks emitted by the wireless telegraph apparatus could be averted by taking suitable precautions. This danger is least with airships of the flexible and semi-rigid types, in which the gas-bag possesses very few metallic parts which could draw sparks from the highly-charged air. The suspension of the car of the "Gross" by hempen ropes insured the complete insulation of the electrical apparatus from the gas-bag, and all parts at which sparks were formed were enclosed in gas-tight envelopes. For military reasons, the details of these experiments have not been published, but the results are said to have been very satisfactory.

These experiments have proved that electromagnetic waves are propagated to great heights in the atmosphere, and that the part played by the earth in wireless telegraphy is far less important than has been assumed. Thus the principal theoretical objections to the application of wireless telegraphy to airships have been removed.

In the German Army manoeuvres of last year the "Gross II" demonstrated, for the first time, the practical utility of wireless apparatus on a scouting balloon. The Zeppelin airship which took part in the manoeuvres did not possess this advantage. Since that time, however, the "Zeppelin III" has been equipped with wireless apparatus, and it has been proved that, even from a metallic airship of the Zeppelin type, wireless signals can be transmitted with safety to a distance of 300 miles or more. All of the newer Zeppelin airships are provided with wireless apparatus.

Let us now examine the dangers to which a metallic airship is exposed from atmospheric electricity and the employment of wireless telegraphy, and the protective measures which have been proposed. The chief source of danger is the inflammable gas with which the balloon is filled. In a thunderstorm a balloon is subject to sudden variations of electric charge which may produce sparks capable of igniting its gaseous contents. Wireless signals are accompanied by equally great and rapid changes of potential, which may produce the same result.

It is probable that the destruction of Zeppelin's airship at

\* (From the Scientific American Supplement.)

Echterdingen was due to atmospheric electric discharges during a thunderstorm. The catastrophe which, in September of last year, befell the French dirigible balloon "Républicque," which fell to earth from a height of more than 300 ft., appears to have been caused by the breaking of a propeller blade, which tore a hole in the gas-bag, and to the subsequent ignition of the escaping gas by spark discharges between it and the large metal parts of the semi-rigid airship. It is a well-known fact that gas or steam, in escaping rapidly from an orifice, acquires an electric charge which may produce powerful sparks.

As the gas cannot be ignited by discharges from the canvas gas-bag, the netting, ropes and similar poor conductors (unless they are converted into good conductors by becoming saturated with water), but can easily be ignited by sparks from the metal parts of the valve and other masses of metal, it is obvious that all metals and other good conductors should be eliminated from the gas-bag. There is no objection to carrying metals in the gondola, and a well-conducting drag-rope is a safeguard against the danger of explosion in landing. If all good conductors are banished from the immediate vicinity of the gas-bag, there would appear to be no danger in the application of wireless telegraphy to airships of the flexible type. If the same precaution is taken, these airships are no more liable than ordinary motorless balloons to ignition by atmospheric electrical discharges.

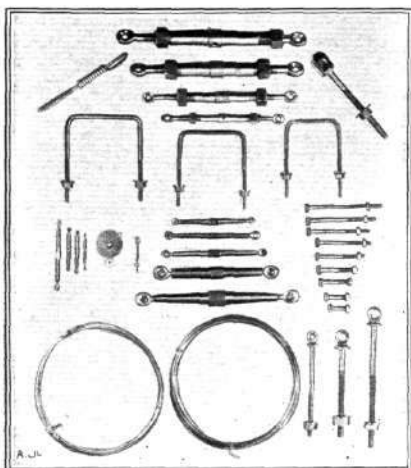
In rigid airships with metal frames the conditions are altogether different. In an article published in the "Electrotechnische Zeitschrift" Dr. Zehnder has shown that in the Zeppelin airship, with its aluminium frame and its numerous gas-bags filled with hydrogen, every condition of easy ignition is satisfied. Between the great cylindrical conducting frame, which is more than 400 ft. long and more than 40 ft. in diameter, and the surrounding air, may exist a difference of potential of 65,000 volts when the airship is horizontal, and of 500,000 volts when it is steeply inclined. A spark capable of causing ignition can be produced by a potential difference of 3,000 volts. As it does not appear practicable to substitute wood for aluminium in the construction of the frame, Zehnder recommends protection of the airship by lightning rods projecting beyond the reach of escaping gas. He also suggests making the gas container of sheet metal, the stiffness of which might make it possible to employ a lighter skeleton, and keep the total weight at its present value. No electrical discharge could take place inside this metal envelope, and the induced surface charge would escape harmlessly into the atmosphere from projecting seams and points. As an additional precaution, the aluminium gondolas could be connected with the metal balloon by a number of wires, so that the aeronauts would be enclosed in a sort of Faraday's cage, which would protect them from external electrical influences.

In regard to the employment of wireless telegraphy on the Zeppelin airship in its present form, Solif suggests an arrangement of the aerial which would minimise the danger of ignition, and would also furnish the best electrical conditions for the transmission of signals. As the hull of the Zeppelin airship is traversed by a vertical shaft or well, it is possible to support the aerial by a simple Eddy kite, which would be kept aloft by the motion of the airship. The wireless apparatus, including the dynamo, would be housed in the middle of the runway which connects the two gondolas. The kite would be connected with the apparatus by a wire from 600 to 1,200 ft. in length, i.e., one-fourth or one-fifth the length of the electric waves employed. A second wire, of the same length, and weighted at its lower end, would hang downward from the apparatus, and would be kept as nearly vertical as possible by insulated stay lines attached to the gondolas. The lower wire might, however, be advantageously replaced by a fan-shaped antenna about 200 ft. long, attached to the frame of the airship, and projecting about 30 ft. below the hull. With this arrangement telegraphic communication would be possible, even when the airship was flying very low. Fouling of the propeller by a broken wire could be guarded against by enclosing the propeller in a protecting frame.

The T-shaped antenna which is carried by ships using the Telefunken system could also be applied without difficulty to the Zeppelin airship, as the metal frame is abundantly able to carry a light, hollow mast about 30 ft. high, which could be raised and lowered by ropes. The stability of the airship, however, would be affected by this rather complicated apparatus more than by the kite device. As experiments made with both the military airship and the Zeppelin airship have demonstrated the feasibility of maintaining wireless telegraphic communication between airships and the earth, we may hope that, in the future, wireless telegraphy will play as important a part in aeronautics as it does in navigation. An indispensable pre-requisite to its adoption, however, is the electro-technical development of means of protection from all danger of injury by the working of the apparatus or by atmospheric electricity.

## SOME AEROPLANE FITTINGS BY WHITEMAN AND MOSS.

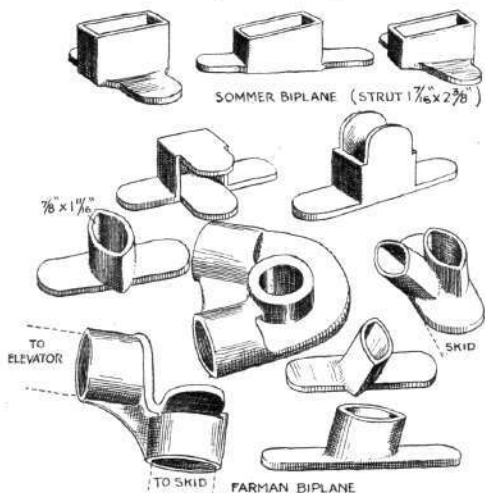
ALUMINIUM lugs and sockets already form quite an important section of the articles included under aeroplane accessories, and no firm has specialised more extensively in their production than



"Flight" Copyright.

Some wire-tighteners, eye-bolts, wire clamps, &c., manufactured by Whiteman and Moss, Ltd. At the top are four Blériot type wire-tighteners with lock-nuts, and underneath there are three Blériot type wire-clamps.

Whiteman and Moss, a selection of whose British made aluminium castings are illustrated by the accompanying sketches. To the general reader the mere variety of shape should be a source of interest, if not of instruction in the amount of detail that is involved in the manufacture of a modern flying machine; to the builder, the illustrations should be an inspiration in design as well as an index



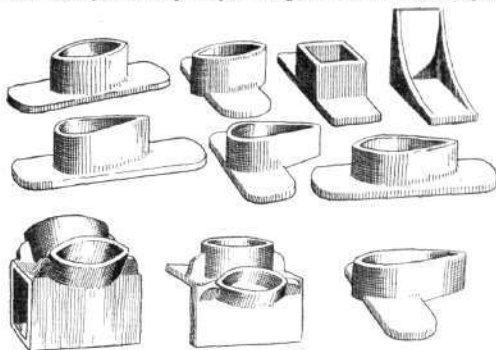
"Flight" Copyright.

In the above sketch will be seen some of the special sockets used in the construction of the Sommer and Henry Farman biplanes. The casting in the centre is the elevator fitting.

to a good market where he can obtain the articles ready made. The sketch of standard sorts includes three types of strut sections—the oval or torpedo-shaped, and the ichthyoid or fish-shaped, the latter being subdivided into two classes, of which one represents struts having a blunt leading edge, while the other includes those

having a sharp leading edge. The illustrations of special sockets relate principally to the types employed for the Sommer and Henry Farman biplanes, and as these machines have an especial vogue at the present moment, the sockets in question are in great demand.

It is worth remarking that Messrs. Whiteman and Moss are prepared to supply all the principal fittings for Farman machines, and



"Flight" Copyright.

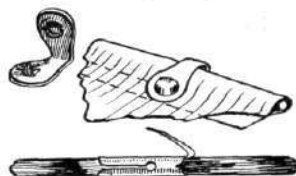
The aluminium lugs and sockets shown in the above sketch are some of the standard types for ordinary work made by Whiteman and Moss, Ltd.

they also supply wire and bolts of every description, some of the principal accessories in this category being illustrated by an accompanying photograph. There are two kinds of wire tighteners, both of the barrel-nut pattern, but one having clamping nuts for gripping the thread. "U" bolts are provided in various sizes as also are eye bolts and ordinary hexagon-headed bolts. These latter are made with various length of shank, all of which are cut with a considerable length of screw thread, which is always a great convenience in bolts used for experimental purposes.

## PORCUPINE QUILLS FOR MODELS.

WE have received from J. O. Lea and Co. a variety of useful and uncommon materials for model aeroplane making, amongst them being some porcupine quills of various sizes, with metal sockets for making joints. These quills should prove to be useful for several parts of a model, as they are light and strong.

Other materials consist of whalebone in strips, broad and narrow, and in rods of about  $\frac{1}{4}$  in. square, small fabric fasteners, and samples of fabric. There is also a special preparation called "Transpormoid" for proofing fabric, that can be obtained in bottles for home treatment. The accompanying sketch shows the method of using the fabric fasteners, and also the socket for joining the quills.



## British-Built Farman-type Biplanes.

A WEEK or so ago we mentioned that Messrs. A. V. Roe and Co., Manchester, had received orders for a couple of Farman's. We hear that these are now almost complete. A Farman in a fortnight is a pretty good record, as all the work is excellent, with no signs of being rushed. One is being fitted with a 40-h.p. "Avro" motor, the other a 60-h.p. E.N.V.

THE Aerial Manufacturing Co. of Great Britain and Ireland, Ltd., 26, Shaftesbury Avenue, W., ask Mr. Gerald N. J. Carr to send his address so that they may send on a copy of their Catalogue, for which he has sent a P.O. for 1s., but omitted his address.

MESSRS. NORMAN and M'KNIGHT, of 145, Argyle Street, Glasgow, inform us that they have been appointed official aeronautical and repairing engineers to the Scottish International Aviation Meeting at Lanark. The firm are erecting an up-to-date workshop on the course, equipped with plant and machinery, whilst a staff of trained builders and mechanics will be always in attendance, ready to execute renewals and repairs to all types of machines. They will also have on hand a large selection of spare parts for all types, together with special timber, wheels, and all conceivable accessories.

## The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

### Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 5th inst., when there were present:—Mr. Roger W. Wallace, K.C., in the chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Mr. John Dunville, Prof. A. K. Huntington, Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. C. F. Pollock, Sir Charles D. Rose, Bart., Mr. A. M. Singer, Mr. Stanley Spooner, and Harold E. Perrin, secretary.

### New Members.

The following new members were elected:—  
Lt. D. Edwin St. M. Delius, R.N. Rowland Charles Mason.  
Harold Gardiner. Miss Agnes Narraway.  
H. Pulsford Hobson. Percy Bertram Boyd Oldfield.  
Percy N. Hooper. W. S. Pilcher.  
Mrs. Vere Ker-Seymer. A. W. Ruthven-Stuart.

**Timekeepers.**—The following official timekeepers were appointed:—

Harry J. Swindley, Z. Wheatley.

**Bournemouth International Aviation Meeting.**—*Aeroplane v. Motor Boat Race.*—The Committee has nominated Mr. Cecil Grace and the Hon. C. S. Rolls to represent the Royal Aero Club in the race between aeroplane and motor boat, which takes place on Friday or Saturday, the 15th or 16th inst., at Bournemouth, in connection with the International Aviation Meeting.

The following reserves have also been nominated:—S. F. Cody, G. C. Colmore, Capt. Bertram Dickson, J. Armstrong Drexel, Lieut. L. D. L. Gibbs, Claude Grahame-White, J. T. C. Moore-Brabazon, Alec Ogilvie, A. Rawlinson.

The Motor Yacht Club has nominated His Grace the Duke of Westminister and Mr. Dan Hanbury as their representatives, with Sir John Thornycroft and Mr. E. S. Hopkinson as reserves.

### Bournemouth International Aviation Meeting.

The International aviation meeting at Bournemouth commences on Monday next, the 11th inst., finishing on Saturday, the 16th inst.

**Programme.**—For the convenience of members the following is the daily programme for the aviation meeting:—

*Monday, July 11th.*—Longest Flight, Speed Prize, Altitude Prize, Slowest Circuit.

*Tuesday, July 12th.*—Longest Flight, Speed Prize, Starting Prize, Alighting Prize, Slowest Circuit.

*Wednesday, July 13th.*—Longest Flight, Speed Prize, Altitude Prize, Weight Carrying, Slowest Circuit.

*Thursday, July 14th.*—Longest Flight, Speed Prize, Weight Carrying, Starting Prize, Alighting Prize, Slowest Circuit.

*Friday, July 15th.*—Longest Flight, Speed Prize, Altitude Prize, Sea-Flight round the Needles (weather permitting), Aeroplane v. Motor Boat Race.

*Saturday, July 16th.*—Longest Flight, Speed Prize, Altitude Prize, Sea-Flight round the Needles (weather permitting), Aeroplane v. Motor Boat Race.

The Official flying hours are 11 a.m. till sunset.

**Admission of Members.**—Members will be admitted to the 10s. enclosure on production of their membership cards and on payment of 2s. 6d. A special enclosed portion of the 10s. enclosure will be reserved exclusively for members of the Royal Aero Club and their friends. A well-furnished marquee will be erected in this enclosure which commands an uninterrupted view of the flying course, and refreshments will be obtainable at one end of the marquee. A portion of the grand stand has also been reserved for members of the Club, and admission will be given only on production of membership card.

**Headquarters.**—Royal Aero Club, Hotel Burlington, Boscombe.

### Balloon Race at Hurlingham.

The next Balloon Race will take place at Hurlingham on Saturday, the 23rd inst., full particulars of which will be announced later.

HAROLD E. PERRIN,  
Secretary.

166, Piccadilly.

## PROGRESS OF FLIGHT ABOUT THE COUNTRY.

(NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.)

### Bristol and West of England Ae.C. (STAR LIFE BLDGS., BRISTOL.)

A LARGE number of members and friends of the club assembled at the Clifton Down Hotel on Thursday of last week for the inaugural dinner of the club. The President, Sir Geo. White, was in the chair, and he was supported by Mr. Roger W. Wallace, K.C. (chairman Royal Aero Club), Mr. Harold E. Perrin (secretary Royal Aero Club), the Hon. Somers Somerset, Sir Herbert Ashman, Bart. (vice-president Bristol Aero Club), Mr. Samuel White (vice-president), Mr. G. Stanley White (vice-president), Col. T. W. Chester-Master, Alderman J. Fuller Eberle, Alderman C. J. Lowe, Professor E. Fawcett.

The toast of "The Club" was proposed by Mr. Wallace, who referred to the part which the provincial clubs could play in the cause of aviation. He also pointed out that Bristol was one of the points in the first 1,000 mile trial of motor cars, and it was also one of the stopping places on the route for the new *Daily Mail* prize. He made the suggestion that each of those stopping places should offer a prize for the aviator who made the fastest trip from the previous halt.

Mr. Samuel White responded to the toast, and said that no new art or science of the nature of aviation could possibly go ahead under satisfactory conditions unless accompanied by the form of control and supervision and responsibility for what took place that were summed up in the existence of such clubs as the Royal Aero Club, at the head of affairs in Great Britain, and the Bristol Aero Club, which had taken upon itself to look after aviation in this district.

Sir Herbert Ashman proposed the health of "The Visitors," which was replied to by the Hon. Somers Somerset and Mr. Harold E. Perrin. The toast of the chairman was submitted by Col. Chester-Master, and in replying Sir Geo. White offered a prize

of £250 for the aviator who made the fastest trip from Manchester to Bristol in the *Daily Mail* contest next July.

The dinner was followed by an excellent musical programme.

### Kite and Model Aeroplane Assoc. (27, VICTORY RD., WIMBLEDON)

ON Wednesday, June 29th, the Association held a youths' competition for the longest flight and general stability at the Aerial Garden Rendezvous, Crystal Palace. A good field turned out, and it was especially pleasing to see how well the juniors make their models. The well-known school club (Arundel House) sent five competitors, who secured first and fourth prizes. The Judges, Messrs. Harry Turrill, C. Brogden, and T. W. K. Clarke, made the following awards:—

Class I, for machines under 2 sq. ft.—First prize, aero requisites value 20s. from T. W. K. Clarke's list, given by T. W. K. Clarke, Esq.; second and third prizes, Aerial League bronze medals:—

- |                     |     |                            |     |       |
|---------------------|-----|----------------------------|-----|-------|
| 1. C. Griffiths     | ... | Monoplane (Ridleyplane 16) | 188 | marks |
| 2. L. H. Harris     | ... | Monoplane                  | 185 | "     |
| 3. G. Clarke-Rogers | ... | Monoplane (Webb type)      | 168 | "     |
| 4. C. Ridley        | ... | Monoplane (Ridleyplane 30) | 160 | "     |

Griffiths won with a very steady flight of 65 yards, and L. H. Harris was second with 63 yards.

Class II, for machines above 2 sq. ft.—First prize, biplane, value £2 2s., given by G. P. Bragg-Smith, Esq. Second and third, Aerial League bronze medals:—

- |                     |     |                         |
|---------------------|-----|-------------------------|
| 1. G. Clarke-Rogers | ... | Monoplane (Webb type)   |
| 2. G. Tester        | ... | Marlborough monoplane   |
| 3. V. MacMunn       | ... | Biplane (curved planes) |

The first place was well gained by the fine flight of 148 yds. by Clarke-Rogers; also G. Tester, with his Marlborough, made a good and steady flight.

Competitors are asked to note that there are another four model competitions at the rendezvous, and that all are open.

The competition for the handsome challenge cup given by Mr. A. W. Gamage should be very keen.

The hon. secretary will be pleased to hear from gentlemen willing to present prizes to the Association, as by model competitions a great deal can be done to forward the science and sport of aviation.

#### Manchester Aero Club (Model Section) (9, ALBERT SQUARE).

DESPITE the rain and wind, several good flights were made at the club's first model flying competition, which took place on Saturday last, at Warwick Road, Old Trafford. A course in the shape of an inverted V, one side being about 240 ft., and the other 150 ft. long, was marked out, and the competitors had to fly their machines over a square marked at the apex of the V, then relaunch from there for the finishing post. Thus the competition was in the nature of flight golf, and each competitor was allowed three circuits of the course, points being given as follows:—

Stability—20 points out and 20 points home.

Direction—20 points out and 20 points home.

Distance—10 points out and 10 points home if each distance was completed in one flight.

Gliding—An extra 10 points out and 10 points home was given for a successful glide after the propeller stopped.

The handsome medal given by the parent club was eventually won by a member of the model section, Mr. Kenneth Kinna, Bignor Street, Cheetham, with a monoplane of his own construction, having a total of 127 points. About ten models put in an appearance. Members and anyone interested in model flying are invited to meet at the workshop, Brownfield Mills, Great Ancoats Street, on Saturday, July 9th, at 4 p.m., to discuss the syllabus of events for the summer and the winter lectures.



## WRIGHT PATENTS LITIGATION.

ON June 18th we published a short paragraph cabled from New York in regard to the injunction dissolved in the above matter. According to American *Aeronautics* the injunction vacated was the temporary one granted the Wright Company against the Herring-Curtiss Company by Judge Hazel at Buffalo.

The history of the action is as follows:—

The Wright Company moved for a preliminary injunction before Judge Hazel. He held the infringement and validity of the Wright patent had been proved without doubt in the hearing and granted the relief prayed for. Judge Hazel, however, was willing to suspend the issuing of the order, but required the defendants to put up a \$10,000 bond until the appeal, which was immediately taken by Curtiss, was decided. Now the Court of Appeals has reversed the Hazel opinion, with costs, and a trial of the infringement suit will now be had before Judge Hazel, with cross-examination of witnesses.

The \$10,000 bond is cancelled.

The reversal of opinion in the case is not a criterion of the outcome, for no trial on merits has been held. The Court of Appeals merely holds that on account of sharp conflict of evidence and the number of affidavits submitted after the original decision, infringement was not so clearly established as to justify a preliminary injunction.

#### Lamson versus Wrights.

CHARLES H. LAMSON, in the United States Circuit Court, has commenced a suit against the Wright Company and the two brothers personally, praying for an injunction restraining the defendants from making, using or selling aeronautical apparatus, such as flying machines, embodying the invention for which Letters



#### Aeronautics at the Northampton Institute.

THE silver medal offered by the Women's Aerial League to the best student in the pioneer courses in aeronautics held during the session 1909-10 has been awarded to Mr. Duncan George, Mr. E. R. Moffat being *proxime accessit*.

In continuation of the above successful evening courses, extended courses of a more complete and practical nature are being arranged for next session, Mr. F. Handley Page, of the firm of Messrs. Handley Page, Ltd., the well-known aeronautical engineers, has been appointed to take charge of these courses. Full details will be announced shortly.

In addition, there is under consideration the establishment of

#### Sheffield and District Ae.C. (22, MOUNT PLEASANT RD., SHARROW)

MR. PATRICK Y. ALEXANDER again paid the club a visit on Wednesday, the 29th ult., being accompanied by Prof. Boulden of the Sheffield University, and at the general meeting both these gentlemen were elected members as well as Mr. Windham, to whom a vote of thanks was accorded for the gift of a large photograph, inscribed with the leading aviators' autographs. Mr. Alexander gave a short address, as did also Prof. Boulden, the latter gentleman, in the course of his remarks, stating that the club could rely at all times on the assistance of the university in matters connected with the scientific side of flight. The following day (Thursday) the glider presented to the club by Mr. Alexander was first brought into use, the club being indebted to Earl Fitzwilliam for the use of the ground at Tinsley. Mr. Alexander superintended operations, and although the climatic conditions were far from ideal, some dozen members indulged in glides. It is interesting to note that the chairman, Mr. A. V. Kavanagh, was the first to fly, and aged 69, claims to be the most elderly exponent of the art.

The club has been instrumental in organising a model aviation meeting in connection with the annual fete and gala at Shirebrook, near Mansfield. All classes are open to all England, and the cash prizes are substantial. The competition takes place on Saturday, the 23rd inst. Entry forms may be obtained from the secretary or Mr. J. Whittington, Central Drive, Shirebrook, near Mansfield.

A large number of members have entered models, and it is hoped with some assistance from other clubs in the way of entries that a good meeting will be held. It may be here stated that the primary object of the club is to arouse interest in the Mansfield district, where it is understood an aero club or society is needed. The secretary (Mr. C. Wightman) has been appointed judge. The next general meeting will be held on Wednesday evening, 13th inst., at 8 p.m. at the club's aero works, 26, Paradise Street, Sheffield. Non-members are invited to attend without obligation.

Patent of the United States were issued to Mr. Lamson, January 22, 1901, No. 666,427. This patent, it will be seen, antedates by over two years the date of application of the Wright patent under which patent the Herring-Curtiss Company and Glenn H. Curtiss and Louis Paulhan have been sued for infringement. The bill of complaint filed as above also asked for an accounting of damages and profits.

The Lamson patent, while stating that the invention relates to "ribbed aerocurved kites," nevertheless sets forth that the construction is capable of use as a flying machine by the application of suitable propelling and guiding mechanism. The patent discloses means for "tilting or inclining" the tips of the wings or planes at each side of the body, and these means are claimed to be equivalent to those embodied in the Wright patent and in the Wright flying machines.

The patent contains the following claim:—

"The herein-described kite having a central frame, wings projecting out from each side of the said frame and means for tilting the tips of said wings with relation to the body of the wing."

Mr. Lamson charges that the Wrights simply incorporated in their flying machine his invention, directed at maintaining lateral stability by warping or twisting the wings or supporting surfaces.

The plaintiffs' solicitors state that: "The Wrights insist that anybody can use a box kite, but Lamson's kite as shown in his patent is a triplane comprising ribbed aerocurves and connecting posts or upright standards jointed thereto corresponding to Wright construction. Also tip warping or tilting means and a tail or rudder having horizontal and vertical members. Lamson's device as patented and operated resembles closely general flying machine structures minus propelling and guiding mechanism."



full-time day courses in aeronautical engineering extending over four years and similar to the well-known day courses in electrical and mechanical engineering established some years ago. A preliminary announcement has already been made in connection with these day courses, and fuller particulars will be ready shortly.

#### Capt. Dawes' Monoplane.

IN view of an erroneous impression, which appears to be current, that Capt. Dawes has been using a Blériot machine for his recent flights, Messrs. Humber, Ltd., ask us to make it quite clear that the machine which Capt. Dawes uses is a British-built Humber monoplane, made entirely at the works at Coventry.

# BRITISH AVIATION MEETINGS.

## The Dublin Meeting.

THE Dublin meeting promises to be a very good meeting from the British flyer's point of view. In addition to Messrs. Grahame-White and Ferguson, it is now announced that arrangements have been made with the Humber Co. for Mr. George Barnes to demonstrate the capabilities of the Humber monoplane.

## Another Irish Flying Fixture.

ARRANGEMENTS are being made for a three days' exhibition by Mr. H. G. Ferguson on his Irish-built monoplane at Newcastle, Co. Down, Ireland, on the 21st, 22nd, and 23rd inst. By permission of the Earl of Annesley, the flying will take place in Donard Demesne, immediately after the athletic sports.

## Cardiff Flying Meeting.

THE arrangements for the flying meeting which it is proposed to hold on the Ely Racecourse at Cardiff on July 24th-27th are being pushed on with as rapidly as possible. The Earl of Plymouth has accepted the Presidency of the meeting, and among others who have agreed to act on the Executive Committee are Lord Ninian Stuart, Capt. D. Hughes Morgan, J.P., the Lord Mayor of Cardiff,

Alderman Lewis Morgan, Principal Griffiths, Mr. J. Thompson Willows, and Dr. Tenison Collins. It is proposed to register a company with a capital of £2,600 to which the public would be invited to subscribe. A prize fund of £3,000 is to be raised, and as this is to be a Welsh National Meeting it is hoped that support will come from all parts of the principality.

## Doncaster Meeting Off.

ALL prospect of the Doncaster meeting taking place this month has now been abandoned, as the promoters have failed to comply the conditions of the Corporation. We understand the Race Committee would not grant the use of the course for next month, as it would be too near to the September races, and not allow time for the turf to be got into condition again.

## Grahame-White to Visit Newcastle.

MR. CLAUDE GRAHAME-WHITE is to visit Newcastle-on-Tyne on August 6th, and give demonstrations of flying there on behalf of the Newcastle Lifeboat Saturday Fund. The gate money will be devoted entirely to the widows and orphans of men who lose their lives in lifeboat rescue work, and is not to be devoted to the funds of the Institution.

# BRITISH NOTES OF THE WEEK.

## A. V. Roe at Brooklands.

ALTHOUGH most of the aviators have been away from Brooklands during the past week, a fair amount of flying has been done there, as Mr. A. V. Roe has made some very satisfactory trials with his new triplane. He has been out nearly every day, and on Monday evening he was in the air for about half an hour altogether. The longest trip was of 11 minutes duration, with just a touch after the first 3½ minutes in the air. This triplane is fitted with a 35-h.p. 8-cyl. J.A.P. engine, and it appears to be a very fast machine. There is very little curvature in the planes, of which the aspect ratio is 8 to 1. The finishing touches are just being put to another triplane for pupils. This will have a span of 32 feet instead of 26 feet, with 350 sq. ft. surface, and a larger curvature than usual in planes in view of the slow flying. Short flights have also been made by Mr. Windham and a pupil on the machine purchased at Olympia.

## Mr. Parkinson at Boldon.

SOME very satisfactory flights were made by Mr. Parkinson on his Blériot monoplane on the Boldon racecourse on Sunday week. They were all made in a straight line, and were of 20 or 30 yds. in

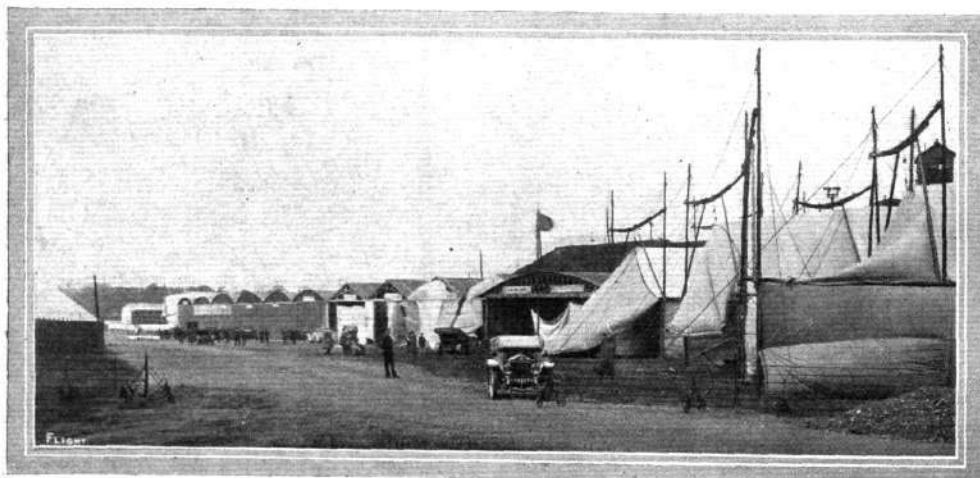
length. During some of them the machine rose to a height of 20 ft. After seven or eight trips had been made the heavy rain caused the experiments to be suspended for a time. When they were resumed Mr. Parkinson made his best trip of the day, about a quarter of a mile in length, at a height which was estimated at 30 ft.

## A Welsh Monoplane.

FOR some time Mr. W. Ellis Williams, assistant lecturer in physics at the University College of North Wales, Bangor, has been investigating the problem of flight, and for the purpose of continuing his experiments has constructed a monoplane of 32 ft. span. The chief novelty lies in the wings, which are of 200 sq. ft. area. In sections they are flat below, but curved above, the camber being about 8 ins. The monoplane is fitted with a 35-h.p. 6-cyl. engine, and the machine is expected to weigh about 700 lbs. The trials are to begin very shortly.

## Things Moving at Salisbury Plain.

MR. HARBROW, of South Bermondsey, is erecting two hangars at Durrington Down, Salisbury Plain, for the War Office, these being now nearly finished. The British and Colonial Aeroplane Co., of Bristol, are also erecting several hangars adjoining.



MIDLAND NATIONAL MEETING.—General view of the hangars, as seen from the railway arches.

**Mr. O. Chanute to Visit England.**

GREAT interest is being manifested in the forthcoming visit of Mr. Octave Chanute to these shores at the invitation of the Aeronautical Society of Great Britain. The veteran experimenter, to whom the Wright Brothers say they owe their introduction to the world of flight, is at present staying for his health at Carlsbad, and proposes to visit England on his way home to America in the autumn. The date has not yet been fixed. Mr. Chanute will lecture before the Society, and the opportunity will be taken advantage of to present him with the Society's gold medal in recognition of his distinguished services to aeronautical science.

**Major Parseval may also Come.**

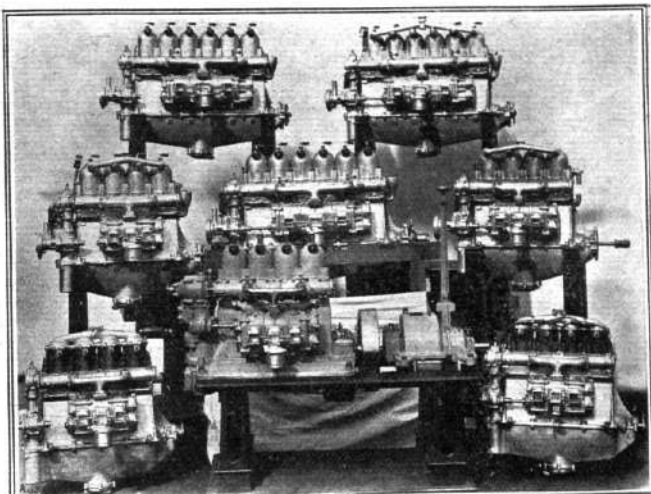
It is just possible that Major von Parseval may also visit these shores during the autumn for the purpose of lecturing before the Aeronautical Society. He has accepted an invitation to do so, but his many engagements may prevent him coming.

**Subsidiary Prizes in the 1,000 Miles Tour.**

It has been suggested by Mr. Roger Wallace, K.C., Chairman of the Royal Aero Club, that in each of the big towns which will form stopping places during the 1,000 miles tour for the *Daily Mail* £10,000 prize, next July, prizes of £250 should be offered for the best performance on the preceding stage. Last week, at the inaugural dinner of the Bristol and West of England Aero Club, Sir Geo. White, the President, said he would be pleased to give £250 for the fastest flight from Manchester to Bristol.

**Dr. Graham Bell and the "Daily Mail" Prize.**

REFERRING to the new *Daily Mail* £10,000 prize, Mr. McCurdy, the Canadian aviator, stated the other day that under the force of such stimulation aviation will not long remain the sport of aviators.



N.E.C. motors have been much favoured in connection with aviation, and the New Engine (Motor) Co., Ltd., are, we learn, full up with work. The above illustration of a group of engines is a batch just delivered, the whole being for flying machines with the exception of the 2-cycle type marine engine in the centre of the photograph.

It will soon enter the arena as a serious business in competition with existing systems of transportation. Dr. Graham Bell thinks the stimulus given by such great prizes can hardly be appreciated by the public. It means the hastening of practical flight by several years.

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# FOREIGN AVIATION NEWS.

**Doings at Mourmelon.**

DURING the week-end Laitsch has made splendid progress with his Voisin, and on Monday he covered five circuits of the camp, and also took his mechanic for a trip. On the 30th ult. Bunau-Varilla carried out a flight lasting 48 mins., taking Bregi and Sée as passengers on his Voisin. See also made three circuits on his own Voisin, while Forest went round five times. On the 1st, at the Voisin School, Bunau-Varilla was out for half-an-hour, and Laitsch and Forest flew for 20 mins. each. Delanghe was also in the air, while Assaky was up for 50 mins., at the end of which he planed down from 300 metres.

**Practice at Juvisy.**

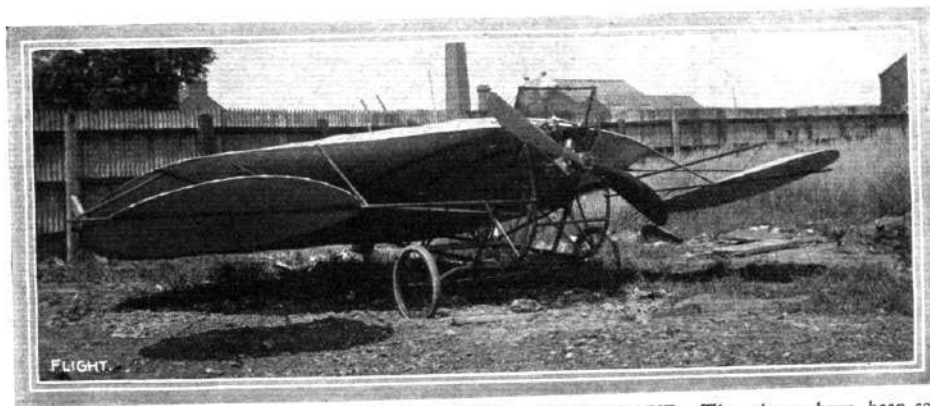
FOR half an hour Koechlin was circling round the Juvisy aerodrome on Monday morning, while in the evening he had the

monoplane out again, and flew for three-quarters of an hour. On Saturday, Champel was flying for three-quarters of an hour on his Voisin.

Duval, on the Saulnier monoplane, made a trip of 15 mins. duration on the 28th ult., but afterwards had a fall from a height of 20 ft., but without sustaining much damage, the aviator escaping uninjured.

**New Regulations at Issy.**

In future, aviators who wish to fly at Issy will have to give three hours' notice to the police, and obtain a permit, for which 18 francs will be charged. Flying will only be permitted between the hours of 4 and 6 a.m., 10 a.m. to 12 noon, and from 5 p.m. to dusk.



MR. ALEXANDER THIERSCH'S EXPERIMENTAL MONOPLANE.—The planes have been constructed by Mr. Handley Page to the design of Mr. Thiersch. The propellers are of French make.



Saint-Germain, as seen from a balloon at a height of 200 metres.

## Sommer Moves to Rheims.

By the aid of several motor luries M. Sommer was last week enabled to transfer a number of his machines from Douai to Betheny, near Rheims, where he is now establishing his headquarters. He has recently been testing a new model, which has proved to be very fast.

## Harding at Amberieu.

MR. HARDING has been making good progress with his J.A.P. monoplane at Amberieu lately, and on the 1st executed two flights, one of 5 and the other of 15 kiloms. length, the altitude being about 10 metres.

## The Zenith School at Issy.

ON the 1st inst., several of the pupils at the Zenith School at Issy made good flights, the best being of ten minutes' duration by Lecoigne.

## Two New French Meetings.

ARRANGEMENTS are being made for a meeting to be held at Caen from the 28th inst. to August 2nd, at which about 100,000 frs. will be offered in prizes. Among the events will be one for military aviators, for which the sanction of the Army authorities has been obtained; and a town to town race, in which competitors will go from Caen to a town about 25 kiloms. away, alight there, and later fly back to Caen. The second meeting is to be held at Nantes, from August 14th to 21st, and the prize-money totals to 60,000 frs.

## International Conference on Aerial Navigation.

AFTER a sitting which has lasted several months the International Conference on Aerial Navigation has suspended its work until November 27th, in order to allow the delegates to fulfil other engagements. It is stated to be practically certain that it will be possible for a scheme to be drawn up by the conference for regulating aerial traffic.

## A Flying Week for Essen.

HAVING obtained 50,000 marks of the sum voted by the Reichstag for the encouragement of aviation, the town of Essen has decided to hold a flying week at the beginning of August.

## Cross-Country Flying in Italy.

AFTER only a few lessons at Mourmelon, Lieut. Savoia showed that he could master the Henry Farman machine, and took one back to Italy. On Wednesday of last week he made a cross-country trip of 40 miles from Centocelle and back, while on the following day he flew from Centocelle to

Bracciano, a distance of 22 miles in 31 minutes. He landed near the airship shed there, and will fly back at the first opportunity. During the trip he reached a height of 3,000 ft.

## Italian Army Gets £1,000,000 Grant for Aviation.

A REMARKABLE scene was witnessed in the Italian Chamber of Deputies last Saturday week, when a sum of 25,000,000 lire (about £1,000,000) was voted for aviation in the extraordinary estimates of the Ministry of War. This money will be expended in the construction and maintenance of aeroplanes and dirigible balloons.

## A Flying School in Italy.

In a few days a flying school will be opened in the well-known plain of Pordenone, in the north-east of Italy. It will be managed by Messrs. Jaccia and Cavicchioni, who have been studying aviation in France for some time, and who are arranging to give lessons on Henry Farman and Blériot machines. It is hoped by this means to have an array of local talent ready for the Milan meeting in September. The new flying ground is under the patronage of the Società Italiana di Aviazione, the Italian representatives in the F.A.I.

## To Fly by Night at Milan.

IN order that the flying at the Milan meeting, to take place from September 25th to October 3rd, may not be curtailed by the darkness, arrangements are being made for the installation of a large number of electric arc lamps. These will illuminate the course, and allow the flying to be continued indefinitely. The prize fund amounts to about £12,000.

## Cross Country Flying in Australia.

THE great cross-country feats accomplished in Great Britain and America have stirred up our Australian cousins, and the Aerial League of Australia is now endeavouring to arrange for a flying contest from Sydney to Melbourne. What is wanted now, they point out, is a big prize, but there appears to be considerable difficulty in finding a public-spirited donor in the land of the Southern Cross.

## Flying Over Montreal.

M. JACQUES DE LESSEPS, who has been making some splendid flights at the flying meeting at Montreal last week, on Monday left the flying ground on his Blériot, and during a 49-minute trip circled over the city for some time. During the time he was aloft, mostly at a height of 2,000 ft., he covered about thirty miles. On Thursday of last week, Brookins on the Wright



Both the Grand Duke and the Grand Duchess Augusta of Austria at Budapest Meeting were taken for flights by Adolf Warchalowski on his biplane. In our picture a general view of the Royal passenger is seen prior to the start.

machine took De Lesseps as a passenger, and carried him to a height of 1,000 ft. Mr. McCurdy, while flying on his biplane, Baddeck II, fell from a height of 50 ft. and was slightly injured.

#### A Farman Biplane at New York.

USING the old Farman biplane which Paulhan sold in America, Mr. Clifford Harmon, on the 29th ult., flew for 1 hr. 5 mins. on the Garden City flying ground near New York. In the morning he took his wife for a short trip. On Sunday he was up again, and flew for 2h. 3m. 30s., which is claimed to be a new duration record for America.

#### Bomb Throwing by Curtiss.

EXPERIMENTS in dropping dummy bombs on to imaginary warships were carried out by Mr. Glenn Curtiss on the 1st inst. before Rear-Admiral Kimball, U.S. Navy, and other Naval and Military officers. The shape of a battleship was marked out by means of flags on Lake Kimka, and out of twenty missiles dropped by Curtiss from his aeroplane eighteen of them are said to have effectually hit the mark.

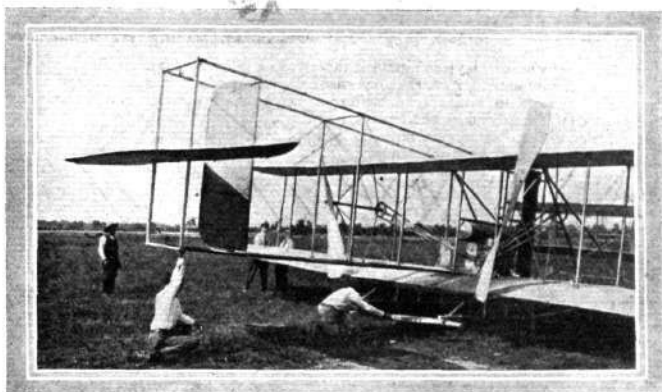
#### Edison on the Flying Machine.

IN an article in the current "Munsey Magazine," Mr. Thomas Alva Edison once more expounds his views as to what the flying machine should be. He thinks progress has been too rapid, and the present machines are only useful for sport.

Flight is 75 per cent. a matter of machine and 25 per cent. a matter of man. The man ought not to figure so much. Of course, present machines are built on wrong principles. Within ten years, says Mr. Edison, "the machine will lift itself and go off to its destination in all kinds of weather at the rate of a hundred miles an hour. It does not take long to perfect an invention after it is once started."

#### £4,000 for a Race between Curtiss and Wright.

ANXIOUS to see how the Wright biplane will fare in actual



**WRIGHT FLYER IN AMERICA.**—Our photograph above, taken at the Wright school at Montgomery, Ala., shows the form of tail which the Wright Brothers are fitting to their own machines. It will be noticed this consists of a horizontal plane and one vertical rudder only.

competition against the Curtiss machine, the Aero Club of Washington has offered a sum of £4,000 to the Wright Brothers for a flight from New York to Washington if they will enter one of their machines against a Curtiss.

#### Wright School Closed.

AT the end of May the Wright Brothers closed their school at Montgomery, Ala., the training of the six pupils having been completed. The names of them are: Duval La Chapelle, of Paris; Walter Brookings, Dayton, O.; Ralph Johnstone and Frank Coffyn, of New York; Arch. Hoxsey, of Pasadena, Cal.; and A. L. Welch, of Washington. The accompanying photograph shows some of these pupils at work.

## AIRSHIP AND BALLOON NEWS.

#### Zeppelin Polar Expedition.

WITH the object of making their preparations for the proposed Polar expedition in a Zeppelin airship, Prince Henry of Prussia, accompanied by Count Zeppelin and their scientific staff, left Kiel on Saturday last on board the N.D.L. steamer "Mainz" for Spitzbergen. The vessel is being accompanied by the steam yacht "Carmen," which is placed at Prince Henry's disposal as Inspector-General of the Navy, the ice-steamer "Phoenix," and the tug "Sirius." The ice-steamer will be used for searching among the drift ice for facilities for landing the airship. It is expected that the "Mainz" will return to Germany at the beginning of September, when, if the scheme is feasible, preparations will at once be commenced for getting the airship expedition ready.

#### "Gross III" has an Excursion.

JUST before midnight on Monday the Gross military dirigible "M III" left Tegel on a voyage to Gotha, in order to take part in the opening of the airship harbour to-day, Saturday, which has been erected there by private enterprise. Incidentally, it was intended to carry out some experiments with wireless telegraphy. At a quarter past five the following morning, however, a violent storm caused Major Gross to bring the airship down at Zeithan, near Riesa, in Saxony. It was intended to resume the journey later, but during the afternoon the airship was dismantled and sent back to Berlin by train.

#### "Gross IV" nearly Finished.

EARLY next month the latest German semi-rigid military airship of the Gross type, "M. IV," will commence her trials. The vessel is a good deal longer than her prototypes, and will be characterised by two cars. The envelope is 94 metres in length, 13 metres in diameter, and of 7,500 cubic metres capacity. Two 100-h.p. motors are fitted, each driving two screws.

#### Russian Airship Fleet.

RUSSIA is determined not to be left behind in matters aeronautical, and it is anticipated that before long a fleet of seven

dirigibles will be in commission. Four will be home-built, two hail from France (a Lebaudy and the original Clement-Bayard), while one is a German production.

#### "Liberté" Practising for the Manœuvres.

IN view of the fact that the "Liberté" is to be utilised during the forthcoming Army manœuvres in France, the airship has been out several times lately in order to get the crew thoroughly used to the working of her. Recently a voyage of an hour and a quarter was made from Chalais-Meudon, above St. Cloud and Auteuil, while on the previous day the airship was cruising for forty minutes in the vicinity of its headquarters.

#### "Zodiac III" Back at St. Cyr.

SINCE having been re-inflated at St. Cyr the dirigible "Zodiac III" has made several excursions lately with Count de la Vaulx in charge. Recently the airship was out for three hours, and in the course of a round trip passed over Fontenay, Villepreux, Sécheroll, Manle, Mantes, and Moisson, where the vessel circled above the Lebaudy works, Jumeaux, Guigen, Le Clays Satory, and so back to St. Cyr.

#### Point-to-Point Balloon Race.

A THUNDERSTORM on Saturday last made the preparations for the point-to-point race from Hurlingham none too pleasant, but during a break in the weather six balloons were sent away. Their objective was Langford, in Essex. First to start was Mr. B. H. Barrington Kennett in the "Comet," followed by Capt. Maitland ("Witch of the Air"), Mr. John Dunville ("St. Louis"), Hon. Mrs. Assheton-Harbord ("Nirvana"), Mr. Philip Gardner ("Kismet"), and Major Baden-Powell ("Aero Club IV"). Although it is not yet officially announced, it is believed that the cup offered by Mr. Mortimer Singer has been won by Mr. John Dunville, who brought his balloon down at Cold Norton, near Maldon, in Essex.

## CAN WE FLY FASTER FOR LESS POWER?

SUGGESTIONS FOR WINNING THE "DAILY MAIL" £10,000.

EVEN if there were nothing else to be gained, the incentive created by the prospect of winning the £10,000 prize offered by the *Daily Mail* is quite sufficient to turn the attention of aviators to the possibilities of increased speed. There is, however, a very good reason for encouraging high speed in any case, for, as it has often been pointed out, the real superiority of flight lies in the anticipated capacity of the flying machine to achieve higher velocities than can be obtained with other means of locomotion. On the other hand, we find aeroplanes of the day equipped with engines considerably more powerful than those commonly employed on automobiles, and yet scarcely able to fly so fast as a car can travel on the track.

That a still further increase in the power of the engines would effect higher speeds in flight is obvious, but it is equally apparent that this line of development is far from satisfactory, in view of the dimensions and weights that obtain with machines in their present form, and it is not unnatural that the question should suggest itself, "can we fly faster for less power than we are using at present?"

Theory, which has the advantage of being far cheaper than practice as a means of obtaining a few preliminary suggestions, would appear to indicate that we are certainly not using the power of our aeroplane engines to the best advantage from the point of view of speed alone. Compare, for example, the conditions represented by the graphs in the accompanying chart. The lines radiating from the lower left-hand corner represent the horse-power consumed in the propulsion of the deck of an aeroplane carrying a load of 100 lbs. at different velocities. Each radial line represents a different sort of deck, the difference being represented by the amount of camber and expressed in degrees by an angle that we have christened the angle of deflection.

Some specimen cambered sections are shown in an accompanying diagram, which indicate how the angle of deflection is measured. Two sets of sections are illustrated, one set having the maximum camber situated about a third of the chord from the leading edge, while the other set has the maximum camber situated further forward, or about a quarter of the chord from the leading edge. We believe this angle of deflection to be the important angle in a

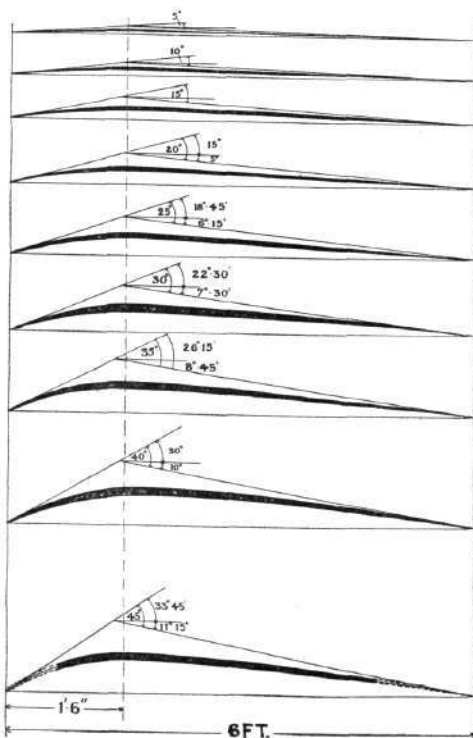
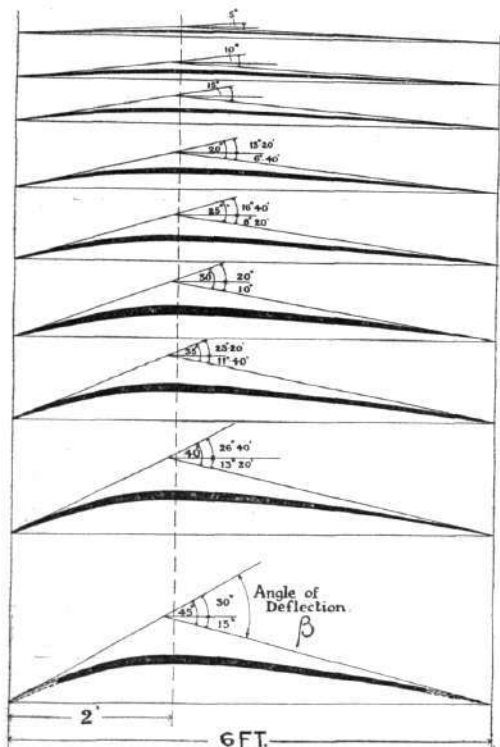
cambered aerofoil, and in a future article we purpose showing how its application to first principles may be made to account for the extraordinarily efficient lifting capacity that such sections possess. It is well known that calculations based on the angle of incidence, as represented by the angle between the chord and the line of flight, afford totally inadequate values for lift.

At the moment we are unable to give exactly the angles of deflection for a specific machine, but it is apparently in the order of  $20^\circ$  for the Wright and Voisin type biplanes. The graph for  $20^\circ$  shown on the horse-power-speed chart indicates that about 16-h.p. is actually consumed in forcing such a plane through the air at 35 miles an hour when it is carrying a total load of 1,000 lbs.

Now if we follow the horizontal line representing this horse-power to the right until it intersects the radial line representing  $5^\circ$ , we shall find that the intersection occurs above the speed of about 75 miles an hour. That is to say, the chart indicates that whereas the flight transport of a 1,000 lb. aerofoil consumes 16-h.p. at 35 miles an hour because the angle of deflection necessary to support the load is  $20^\circ$ , the same power would be adequate to the transport of the same load at about 75 miles an hour if it were located in an aerofoil having an angle of deflection of  $5^\circ$ . A glance at the specimen cambered sections shows that such an aerofoil is almost flat.

If instead of a section having an angle of deflection of  $5^\circ$  we consider the case of one having an angle of deflection of  $10^\circ$ , then the expenditure of 16-h.p. would result in a flight speed of about 62 miles an hour with a load of 1,000 lbs.

At this point it is necessary to emphasise the limitations of the above statement, which is based on the assumption that the load is located entirely inside the plane itself, and that there is no sort of external encumbrance on the machine. The practical aeroplane, however, necessarily has an outside body for the accommodation of the engine and pilot; it exposes also many of the struts and ties used in construction, together with a considerable extent of supplementary surface that is employed in the control of the machine but in no way contributes to its support. All these members offer a resistance of their own to motion through the air, which resistance



CAMBERED SECTIONS for DIFFERENT ANGLES with the Max. Camber  $\frac{1}{3}$  &  $\frac{1}{4}$  of the Chord from leading edge-

increases very rapidly with the speed and has to be provided for with additional power.

It is, of course, perfectly obvious that the flying machine of the far future must still possess extra resistances of this order in some degree, but, and this is the important point, constructive ability and inventive genius may conceivably reduce them to a very small value.

Be the supplementary resistance great or small, however, the fact remains that it is an "extra," and cannot possibly affect the efficiency of the planes themselves except so far as it may interfere with the air streams. It is not true, on the other hand, to say that the extra resistance does not affect the best speed for flight; it does, as a matter of fact, put a practical limit on the speed for a given power, and inasmuch as it does this it determines the camber of the planes of a given size for a given load. If, however, the amount of extra resistance is small compared with that of the plane itself, this will not debar the designer from constructing machines capable of flying far faster than they do at present and without the expenditure of additional energy, since by flying faster with flatter planes they will, as the accompanying horse-power-speed chart shows, be working under much more economical conditions. In a future article we shall endeavour, by means of another chart, to give some indication of the total power required, but for the moment space prevents us from dealing with more than one point at a time, and it has seemed to us that the most important aspects of the case are centred in the design of the planes, in an appreciation of the angle of deflection, and in a recognition of the very important fact, which ought to be expressed as a rule in aeroplane design, that the condition of maximum efficiency for the planes alone is independent of the existence or otherwise of any body resistance.

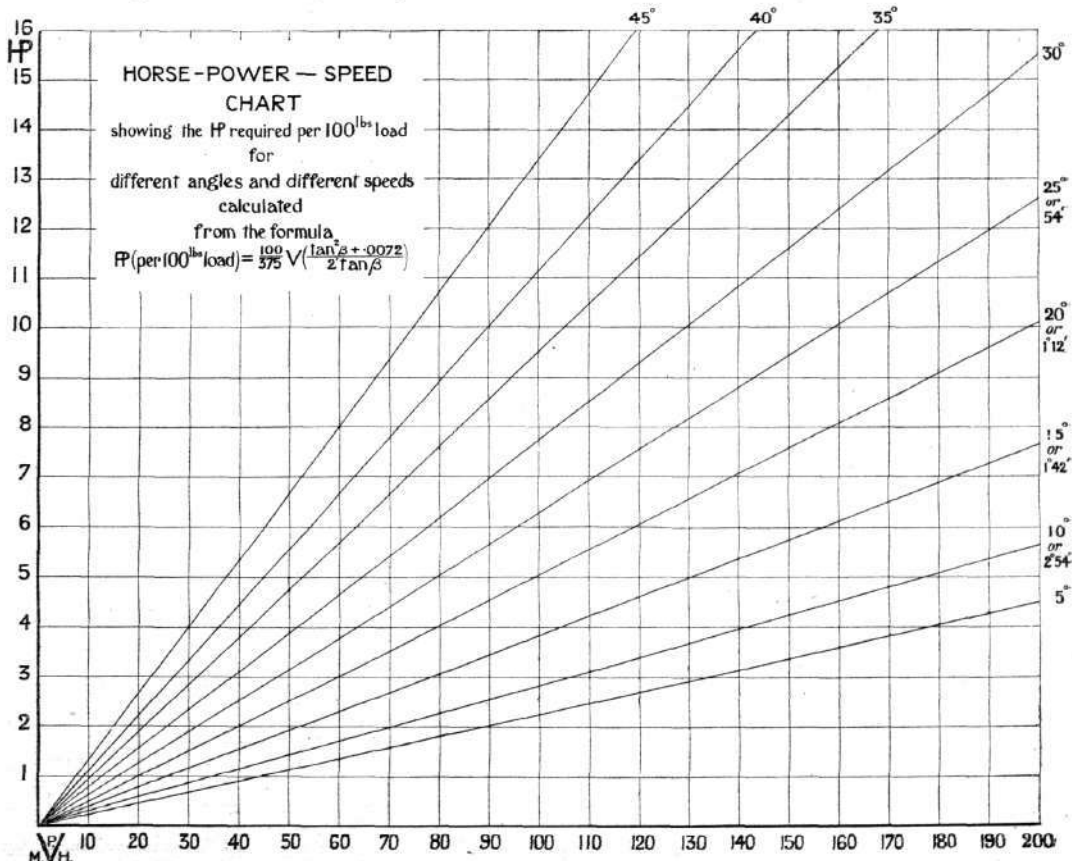
The horse-power-speed chart is worth studying on its own account, for it will be observed that the lowest of the series of graphs is marked with the value  $5^\circ$ . This implies that a cambered section having an angle of deflection of  $5^\circ$  is the most efficient that it is possible to use in flight. In a future article we will show in greater detail how that angle has been obtained; for the present it must

suffice to draw attention to it and to state in parenthesis that the determining factor has been an assumed coefficient for skin friction based on Zahm's experiments, these affording the most reliable data at present available. It has further been assumed that skin friction is proportional to the square of the speed in order to take advantage of a very convenient consequence, viz., that the condition of minimum total resistance obtains when the aerodynamic resistance and skin friction resistance are equal to one another.

It will doubtless have occurred to many who read this article that the conclusions are reminiscent of Langley's famous "law," to the effect that the power required for flight diminishes indefinitely as the speed increases. Our conclusions, however, are not the same as those of Langley, for what we show by means of the accompanying chart is that the power required for flight diminishes definitely with increasing speed until the load is supported by a cambered plane having an angle of deflection of  $5^\circ$ , after which the power increases very rapidly at higher velocities, so that a plane having an angle of  $1^\circ 42'$  has an equal efficiency to another plane in which the angle is  $20^\circ$ .

Langley actually observed during his experiments that the absolute power required to drive his models did decrease as the speed increased, but he made the mistake of enunciating his observation in the form of a law. As a law it does not hold good, but as a means of drawing attention to the economy of high speed, Langley's observations deserve wide recognition.

As we have never seen any satisfactory explanation of the causes that led Langley to make his error, it may not be out of place to offer what appears to us to be the solution to this somewhat interesting and much discussed case. It may, perhaps, have escaped the notice of many readers of Langley's "Experiments in Aerodynamics," that the model planes with which he experimented were very heavy; they were generally made of wood, and often mounted in a metal frame; they represented, in fact, a loading in the order of 1 lb. per sq. ft. It is impossible to carry a loading of this value at a moderate speed except by the use of a considerable



angle, and the use of a considerable angle implies that the aerodynamic resistance is proportionately great as compared with the skin friction. This Langley observed to be the case; indeed, he speaks of the skin friction as being negligible. Langley drove his models through the air at high speeds, but he was apparently unable to go fast enough to bring the skin friction within the realm of appreciable magnitude, let alone into the position of equality with the aerodynamic resistance which would have represented a condition of minimum resistance and the limit of his observation of diminishing power. If Langley had employed very light planes such as would have been supported at very small angles at com-

paratively low speeds, he would have observed that his higher velocities made a considerable difference in the relative value of the skin friction, and even had he not been able to actually attain the speed of minimum total resistance, his scientific mind would certainly have seen the necessity of taking account of skin friction in the application of his experiments to theoretical deductions. Langley's error consisted of overlooking the consequences of the law of skin friction, with which he was in all probability familiar, but the import of which he had apparently allowed to be obscured in his mind by the insignificance of the skin friction values that his experiments provided.

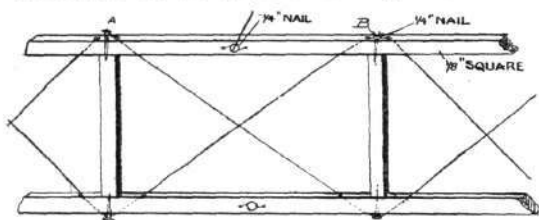
## CORRESPONDENCE.

\*. The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

NOTE.—Owing to the great mass of valuable and interesting correspondence which we receive, immediate publication is impossible, but each letter will appear practically in sequence and at the earliest possible moment.

### BLÉRIOT FRAMEWORK.

[594] Several correspondents lately have asked for details of Blériot framework for models; I hope the attached sketch will interest them. No wire strainers are necessary, as the nails hold



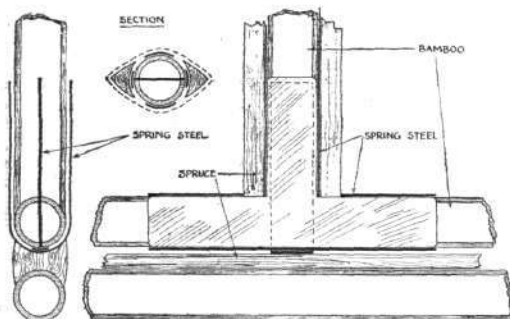
the wire firm at each joint. Twist wire round the French nail at A, and then drive nail home (B). This makes a very substantial joint. Brockley, S.E. "KLARK."

### BAMBOO JOINTS.

[595] In a recent issue of your valuable paper, some questions were asked about bamboo; I therefore send you a sketch of a joint which does not require crossed wires to strengthen it.

The patent claims this to be, weight for weight, the strongest, lightest, and neatest way of making joints and framework for aeroplanes and dirigibles.

By treating the inside and outside of the spars with glue and varnish, and binding when wet with cotton tape and silk, very



greatly increased strength and reliability is obtained, and the thin strips of spring steel and the binding prevent a broken spar from dividing and doing further damage to the aviator or his machine.

Joints and crossings can be made at any angle, and a broken spar neatly spliced, and, if necessary, made stronger than before by inserting a thin steel plate and binding.

For dirigibles, this framework will not interfere with wireless telegraphy as metal does, and it may perhaps be of practical service to the new science of aviation.

Barnes.

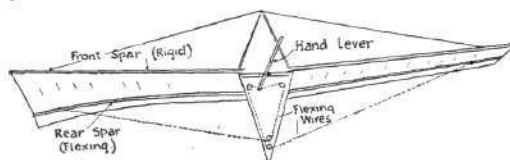
PAM DALTON.

### WING WARPING.

[596] Would you kindly inform me through the medium of your valuable paper of what movement "warping the wings" consists of, and how this movement is generally controlled. I might mention that I am particularly interested in the control of the "Macfie" monoplane. Thanking you in anticipation, Sparkhill. L. T. M.

[The accompanying sketch illustrates diagrammatically the warping control on the Macfie monoplane, and serves to illustrate the general principle.

Warping consists of deflecting the trailing edge of one wing while the trailing edge of the other wing is simultaneously flexed upwards. An actual reversal of the camber seldom takes place



in the latter case. The wing that has its trailing edge deflected downwards exercises a relatively greater lifting effect than the opposite wing, and consequently raises its own side of the machine if both wings are forced to proceed through the air at the same speed.

A disturbing influence is introduced by the fact that the deflected wing offers a greater resistance to motion through the air, and therefore tends to slew the machine from its true path. This is why the rudder has to be used in conjunction with wing warping, in order to keep the machine straight. If the slewing effect is allowed to take place, the increased lift of the depressed wing will be lost and the machine will capsize.—ED.]

### THE NEGATIVE ANGLE AND AN APPARENT PARADOX.

[597] With reference to the discussion on the practicability of flight with planes set at a negative angle, it strikes me as impossible for the reason following:—

The inventor claims that planes set at a negative angle support the machine. A support implies an upward thrust. If, therefore, two planes be made up into a propeller it would work effectively, giving a thrust in the same direction whichever way it was rotated.

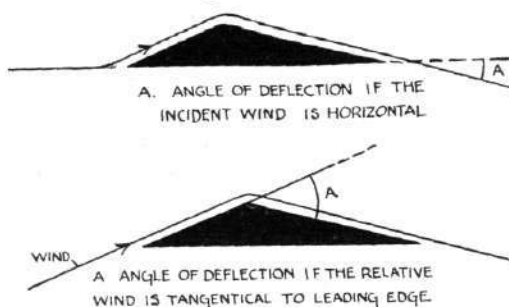
A. H. HORN.

[It is a clever deduction that has been made by our correspondent in the above letter, that the combination of an aeroplane with a negative angle and another with a positive angle of incidence (chord the wind) would form the elements of a propeller theoretically capable of exercising a uni-directional thrust, irrespective of the direction of rotation. Mr. Horn evidently concludes that this is a *reductio ad absurdum*, and, therefore, a logical reason why an aerofoil with a negative angle should not exert a lift.

With this conclusion we are, by no means in agreement, although we admit that the problem is in the nature of a paradox. A little investigation will show that the suggested arrangement of aeroplanes is aerodynamically similar to Sir Hiram Maxim's "paradox" aeroplane, which he describes on page 87 of his "Artificial and Natural Flight." Reference is also made to this device in FLIGHT, Vol. I, page 75, where Sir Hiram Maxim's early lift and drift experiments formed a subject of a special article.

Incidentally, this subject is allied to two other aspects of the aeroplane that are attracting the attention of readers, one being the phenomenon of "upper surface lift," and the other being the question of the relative importance of the angle of incidence, and the angle that we have decided to call the "angle of deflection."

Sir Hiram Maxim, speaking of his paradox aeroplane says:—"When the aeroplane is made very thick in the middle, and sharp at the edges (see sketch), with the bottom side dead level, it produces a decided lifting effect, no matter which way it is being propelled through the air. This is not because the bottom side produces any lifting effect of itself, but because the air running over the top follows the surface. The aeroplane encounters air which is not moving at all. The air is first moved upwards slightly, but it also has to run down the incline to the rear edge of the aeroplane so that when it is discharged it has a decided downward trend



therefore, the air passing over the top side instead of under the bottom side produces the lifting effect, showing that the top side of an aeroplane as well as the lower side should be considered."

Now Sir Hiram Maxim satisfied himself by experiment that lift existed, and the above is his explanation of the phenomenon, which, in the light of more satisfactory evidence to the contrary, we accept as descriptive of the physical conditions obtaining, in spite of the fact that many who experiment in this direction seem to find it easier to produce vortex disturbances on the upper surface than stream-line flow. The point to which we specially wish to draw attention in this connection is the absence of a positive angle of incidence, and the necessity therefore of explaining the phenomenon of lift by recognising the primary importance of the angle of deflection. If those of our readers who are interested in this subject will again refer to page 238 of our current volume they will find diagrams illustrating this point, and also several remarks relating to the subject. In connection with the angle of incidence, too, it is of interest to refer to one of the conclusions in Lapchev's "Aerodynamics," where it is shown that an aerofoil, having a section represented by the arc of a circle and an attitude in which the chord is horizontal, satisfies the "essential" conditions. (See Lapchev's "Aerodynamics," pp. 275-281.)—Ed.]

### CYCLE-AEROPLANE.

[598] I have been studying your papers for some considerable time, and found it a very interesting subject to take up, since the London to Manchester has attracted so much public attention.

I am now starting as a beginner, and I wish to know what is the difference between the following planes:—Aeroplane, monoplane, biplane, and a glider. I am making a model aeroplane, which is 45 in. long, 12 in. high, and 18 in. wide. Its weight is about 3½ lbs. at the most, and I wish to know whether you think it advisable to have an electric motor to work it, and how many revolutions per minute would you think suitable for working the propeller or propellers, sufficient enough to take it up. With regard to using propellers, if one propeller is only used to work a machine, is it much longer and wider than as if three were in use?

I am thinking of constructing a cycle-aeroplane, and could you tell me the most suitable wood for the framework, and what kind of wood is used for propellers. Has a cycle-aeroplane been invented yet, and if you were making one would you consider 16 ft. long, 14 ft. wide, and about 4 ft. to 5 ft. high too much? Hoping to see your valuable information in your paper.

Baltham.

B. BAKER.

[The meaning of the terms mentioned will be found in the glossary of the "Flight Manual." Monoplanes, biplanes and gliders are all aeroplanes. The former are single and double-deck machines respectively, while the last-mentioned implies a motorless device.

It would be preferable to commence experiments with an elastic motor.

One propeller capable of exerting the same thrust as three propellers would either be of a larger diameter or rotate at a higher speed.

A cycle-aeroplane has been invented, but we have not heard of its success.—Ed.]

### THE CYCLOPLANE.

[599] Your correspondent "O. D. A." (letter No. 551) confuses my "Cycloplane" shown in the first Aero Show at Olympia with another man's "Cycle-aeroplane," shown in the second Aero Show, having a notice affixed, "If this machine fails to fly at the Crystal Palace before the end of the month, all orders for it will be automatically cancelled."

The Cycloplane is an aeroplane attached to a cycle to relieve the tyres of some of the rider's weight. There is no propeller fixed, and the fact that the cycle's tyre adhesion to the road is essential for propulsion should dispel the idea that the Cycloplane is intended for flight.

From a scientific point, the Cycloplane is a great dodger of wind currents; no matter how quickly you turn a corner of the road the Cycloplane automatically veers into a new and correct position. Two years ago I tried about forty different shapes and constructions, but found the inverted dihedral the only safe type in a side wind, because the weight is so far below the centres of pressure and lift. In side winds the other shapes quickly took me into hedges, but the inverted dihedral rather draws the aeroplane into the wind.

The Cycloplane on the market is only one application of the patents covering it. I shall have a flying machine shortly finished embodying another application of the inverted dihedral, and shall be pleased to give your readers the benefit of any further results after getting over the initial engine and other troubles, and hope it will turn out to be the two-speed machine you have so strenuously advocated in FLIGHT.

Gargrave.

JOHN GAUNT.

### STEERING CONTROL.

[600] I am sending a diagram with description of a novel steering control, for insertion in your useful paper.

There are three motions from this control:—

1. The wheel can be turned, the steering column being kept in the same straight line. This turns the spindle through the universal joint, N. There is a wooden drum on the spindle, between the two supports, M and P. This has a wire round it which can be led to operate the vertical rudder for horizontal steering.

2. If, however, the whole steering column is swung right or left, sliding along a wooden quadrant rest, and pivoted about the joint, N, then a tiller motion at R results. This can be made to operate wires by a ring, R, sliding between two collars, 1 and 2, the wires operating ailerons.

3. If the wheel and column are thrust away from or drawn towards the aviator, the spindle (cross-section shown at AB) will slide through the drum without moving it, and will not affect the ring, R, as it has a space to slide between 1 and 2. A ring, S, loose between two collars, operates two wires, as shown, which are led to the elevator or horizontal rudders.

The tiller motion has little or no effect on these last-mentioned wires. All three motions, or any two, can be combined at will.

Dartmouth.

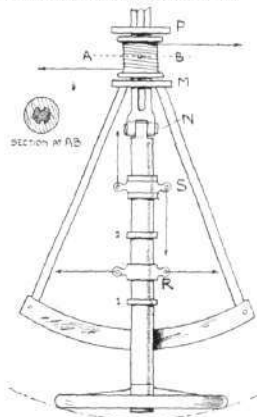
N. F. WHEELER, Naval Cadet.

### DIHEDRAL ANGLE.

[601] Re Mr. R. C. Clinker's reply (No. 502) to Mr. Flight's letter (No. 410), might I be permitted to make a few remarks? Surely the machine has a tendency to regain the horizontal position as soon as it has left it, as while the machine is progressing forward it is virtually continually ascending, though it actually keeps in the same plane, therefore there must be an even pressure on the planes in the direction P<sub>1</sub>, P<sub>2</sub>. This pressure is equal for any given distance along the vertical line, A, B, from the centre; to be more explicit, if OX, OY, are equal, the pressure is equal, then points may be projected on to the planes giving the points, Z, V.

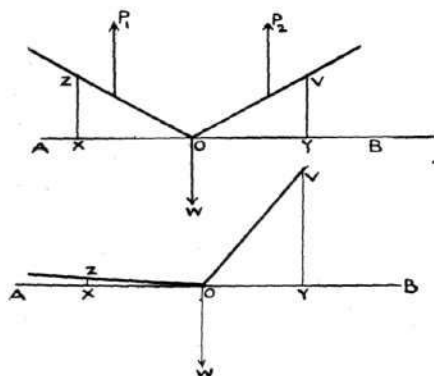
So on the equal portions of the planes, OZ, OV, there is equal pressure. Is that not so?

Now, when the machine tilts, what do we get? If the machine is still travelling at the same speed, &c., the pressure for unit length of A B will be still the same, namely, OX = OY. But now



project these points on to the planes, then we get equal pressure on OZ and OV. OV is virtually the whole plane, whereas OZ is only about two-thirds of the plane. So the remainder of the left-hand plane is devoted to the tendency of righting the machine. Of course there will be considerable slip on the right-hand plane, but this, though having a tendency to cause the machine to drift, would be helpful to the righting effect of the left-hand plane.

I think the matter turns on the direction of  $P_1$ ,  $P_2$ , which must be parallel to the force, W. Of course, this is only my opinion,



backed by experience with models, and I shall be only too pleased if I am on the wrong track.

This righting effect can be seen by taking a piece of paper 2 ins. wide and about 8 ins. long and bending it in the middle, giving it a dihedral angle. If this is dropped at any angle it will automatically right itself.

Croydon.

ARTHUR C. BASERE.

## STABILITY DEVICE.

[602] I wish to have your opinion on the following appliance, which I believe will give automatic stability to aeroplanes.

Attached to the wheel working the warping or aileron wires is a small reversible electric motor, the necessary power to actuate it being derived from a battery. Connection is given by a device somewhat like a spirit-level, excepting that mercury takes the place of the spirit, and that it is slightly concave. When the aeroplane tilts over, the mercury in the tube falls to one side, forming a connection between wires from battery to motor, which being set in motion warps the planes. The rudder also has an attachment to the motor, this completing the necessary action to obtain lateral stability.

As the relative action of the rudder with warping to effect a turn is different, hand manipulation is to be used for circling movements, the stabilising device being automatically disconnected.

Longitudinal automatic stability could be arranged for in a similar way, with the exception of the connection for the rudder.

Of course, the motor is not directly connected to the warping wires; however, the mechanical difficulties are not great, and I have evolved quite a number of methods to produce the various actions.

Hand-control could always be resorted to in emergencies, but I think that my method, besides serving to keep the aeroplane in automatic balance, would be of much use in case of a sudden breakdown of the engine, and also lessen the constant nervous strain on pilots during lengthy flights.

I have had this idea of automatic control for quite some time, and although I have never seen or heard of an appliance of this kind, it seems to me to be simple and feasible.

If my explanation is not sufficiently clear, perhaps I could send you one or two rough designs.

Trusting you will favour me with your opinion as to whether it is a practical idea, and with best wishes for your continued success.

Sunderland.

J. H. DORAN.

[The mercury tube device has been invented as a means of indicating, by means of coloured electric lights, the canting of a machine in flight, and has also been invented as a means of throwing into action a relay mechanism for manipulating the control-gear, although the exact details may not have been quite the same as those described in the above letter. We are not aware that the device has ever been used in practice, and it is therefore impossible to say how it would act. Everything depends, of course, upon the steadiness of the motion being such as to prevent the mercury from setting up a natural oscillation from one end of the tube to the other.—ED.]

## FLOATS FOR AEROPLANES.

[603] I am very much obliged to Miss Bland for her interesting table of weights carried by different gliders. I notice that she asks for information re the use of floats for starting aeroplanes over water. I remember that Mr. Bellamy tried floats at Brooklands some three years or so ago, for the purpose of testing propellers, but I do not think they were very successful. It might pay to use some arrangement like M. Santos Dumont's hydroplane, and to place planes similar to aeroplane surfaces below, so that as the speed is increased the apparatus rises, and the resistance becomes less. It is quite likely that this method has been tried already, but I am not sure. Miss Bland has certainly attained a wonderful success with her glider, and I shall be most interested to hear how the power-driven machine behaves. I hope it will be equally successful.

Windsor.

W. WHATELY SMITH.

## PROPELLER REACTION.

[604] It has puzzled me for some time how two propellers could possibly nullify the effects of torque when one engine only is used. In a good many types of models which I have seen two skeins of elastic and two propellers are used, and that, to me at least, appears to be as it should. But in the Wright biplane, for instance, surely the reaction of the engine must have the same effect as it would if only one propeller were used.

If my assumptions are incorrect, I should be very glad if you or one of your readers could put me right.

Park Royal.

DAVID LUCKING.

[The engine torque is not balanced by the use of twin propellers.

Twin propellers ought to be used instead of a single propeller when the calculations show that greater efficiency and convenience will result therefrom. See recent article on testing propellers. When two propellers are used it may be deemed desirable to cause them to rotate in opposite directions in order to neutralise their gyroscopic effect. Some constructors, however, consider this to be an unnecessary precaution.—ED.]

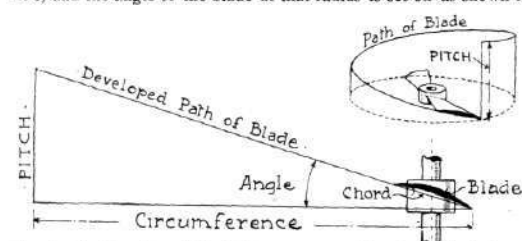
## THE PITCH OF A PROPELLER.

[605] Could you tell me through your valuable paper exactly how to get the pitch of a propeller? I must state right here that I don't understand mathematics. Has the diameter anything to do with the pitch? I understand that the angle at which the blades are set affects it, but on most propellers the angle varies from the boss to the tip. If you would explain you would very much oblige.

Park Royal.

INQUIRER.

[Possibly the accompanying sketches will serve to elucidate the difficulty. The pitch of most propellers is constant along the blade, consequently the angle varies from tip to root. At any radius, if the circumference corresponding to that radius is set off in a straight line, and the angle of the blade at that radius is set off as shown in



the sketch, then the pitch will be represented by the vertical drawn from the opposite end of the circumference line, as shown. A series of such diagrams drawn for different radii will produce the same pitch with a propeller blade as ordinarily constructed.

The sketches illustrate the pitch represented by the angle of the chord. It is a moot point whether this should be taken as the datum from which to estimate the true pitch, but it serves the purpose of illustrating the meaning of the term.—ED.]

## EXPERIMENTAL GLIDER.

[606] I intend to build a glider, and would be very much obliged if you would answer me the following question, viz.: Would biplane glider, 18 ft. span, chord, 5 ft., height, 4½ ft., tail, 6 ft. by 3 ft., have enough area to carry a boy of fifteen?

Headingly.

P. GARNETT.

[Much depends on the weight of our correspondent, but, allowing 130 lbs., every square foot of surface would then carry a little under three-quarters of a pound load, which is about as much as ought to be allowed in experiments of this sort, at any rate until experience has been gained in connection with gliding in high winds.—ED.]

## MODELS.

### RECIPE FOR PASTE.

[607] As ordinary paste is unreliable, and often very disappointing, the following is a good and most useful cement, suitable for any parts of an aeroplane where an adhesive of the kind may be necessary.

Take enough good flour to make a 1 lb. jam jar fairly full of paste, to this add a good teaspoonful of finely-powdered resin, mix well with the dry flour, then add a little clean cold water to form a stiff paste, smooth with the back of a spoon, and then nearly fill up jar with boiling water, well stirring all the time. Set the jar in a saucepan of water on a slow fire, keep it hot while stirring until the resin is melted and the paste thickens. Remove from fire, and stand aside to cool, stirring occasionally till cold, then use as required.

Made as above, this paste is a strong adhesive, and very durable, and the resin, while imparting a flexible quality, also resists damp and actual moisture to a greater degree than when made in the ordinary way.

Newport Pagnell.

HENRY BATH.

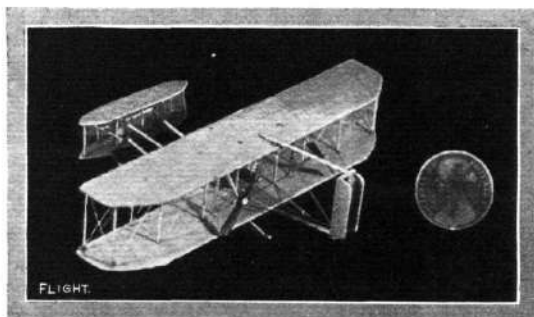
### MINIATURE MODEL.

[608] Being a regular subscriber to your paper, FLIGHT, since its publication, and knowing what kind and sympathetic interest you extend to amateurs and students in the art of flying, I venture to submit to you for criticism a model in miniature of the Wright biplane. The chief novelty in the construction of same is the absolute exactitude in detail, i.e., hand-carved propellers, wires, stays, control, engine, radiator, &c. If you would look at it, and give me your candid opinion as to whether I could find a sale for this type of work I should consider it a great favour.

Bromley.

JOSHUA UPTON BENNETT.

[The accompanying photograph is an illustration of the model referred to in our correspondent's letter. It is certainly a beautifully-executed example of miniature model making, and should be



attractive to anyone who is desirous of forming a collection of modern flying machines on a small scale. A penny is shown alongside the model as a guide to its size.—ED.]

### MODEL MOTORS.

[609] Could you please forward to me a few names of firms who supply spring or any small motors for experimenting purposes with models, and is it possible to get one that would drive a pair of tractor screws with gear and chain; the size of screws to be about 9 ins.?

Shepherd's Bush, W.

H. J. HERBER.

[Several makers of suitable motors are now advertising in FLIGHT.—ED.]

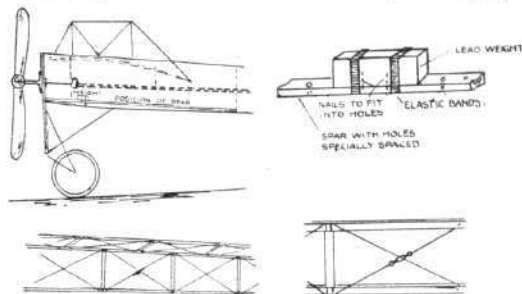
### ELASTIC MOTORS.

[610] Your correspondent, although he primarily asks for a table that could be generally used to determine the necessary amount of elastic per foot of sustaining surface, later explains that he requires to know what would remedy the apparent defect in his machine. We employed about fifteen lengths of  $\frac{1}{8}$ th strip best Para rubber.

From the sketches of his framing, and the exceedingly small weight, we gather that this is a Blériot "type," and not a genuine model. Our framing was constructed as illustrated in the accom-

panying sketch. The yellow pine used was seasoned for 20 years previously, and despite its lightness, it is exceedingly strong.

It would not help him to know where our c.g. lies, owing to the difference in weight. We would suggest that he should place a sliding weight of about  $\frac{1}{2}$  oz. in the front of main framing, as per accompanying sketch. He could then alter the c.g. to suit c.p. by



manipulating the weight. If his machine will not glide, it will fly; but if it will glide, let its behaviour be carefully noted, and it can then be made to fly.

Our ball-bearing thrust weighs nearly an ounce, having the distinct advantage of a balance, serving a good purpose.

It appears that he is trying to "run" before he can "walk." For no less than four months we daily practised gliding with an original glider of 4 ft. span. It was subjected to sharp draughts at intervals, and its behaviour noted. Such experience as this is necessary to make a successful flying model.

Lowestoft.

R. and L. RICHARDS.

### ELECTRIC MOTOR.

[611] I have built a "Farman" biplane one-eighth actual size, lifting surface over 7 sq. ft., the machine weighs 2 lbs.

I want to know where (if at all) I can obtain a suitable 4 or 8-volt motor, which would drive the propeller (12 in. by  $1\frac{1}{4}$  in. blades) at about 1,000 revs. per min. Such a motor would weigh probably 2 lbs. or so, and with dry cells, the entire weight of machine should be well under  $5\frac{1}{2}$  lbs.

Would the machine be capable of carrying this weight provided a sufficiently high number of revs. were kept up?

Perhaps some of your readers could oblige me with the information I require. Thanking you in anticipation,

Bingley.

JOHN HIRST.

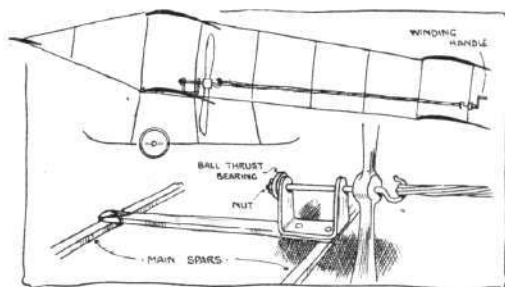
### MODEL FARMAN BIPLANE.

[612] Having constructed a model Farman machine as per your drawings in your issue of FLIGHT, October 16th, 1909, I shall esteem it a favour if you could tell me how to fix an elastic motor to same with a suitable propeller.

The planes are 23 $\frac{1}{2}$  ins. long, 4 $\frac{1}{2}$  ins. wide, its total length being 29 $\frac{1}{2}$  ins., with a weight of 5 $\frac{1}{2}$  ozs. The framework is made of split cane, the joints being lashed with strong wax thread.

C. WHEELER.

[The accompanying sketch is merely a suggestion of a method that might prove suitable for the machine in question. Unfor-



tunately, we have had to imagine the details of the machine, as well as those of the propeller mechanism, for our correspondent did not submit his designs.—ED.]

## ELASTIC MOTORS.

[613] Could any of your readers inform me through FLIGHT what size tractor screw and number of strands of elastic would be required for a model monoplane, Blériot type, that I have made, to enable it to rise from the ground. The dimensions of the machine are as follows: 2 ft. 6 ins. long by 2 ft. 6 ins. wide, measuring from end to end of main planes. Weight, 10 ozs., exclusive of screw. Newport. W. W. WAVELL.

## ENQUIRIES.

- [614] S. Grundy wishes to know if there is a model aero club in the Wigan district.  
[615] S. Grundy wishes to hear from anyone who has a 1/2 h.p. air-cooled petrol engine to dispose of second-hand.  
[616] N. S. Barker asks for working drawings for a model Henry Farman biplane, 5 ft. span.



## A Win for Pratt's Spirit.

DURING the high flight record made by Mr. Armstrong Drexel on June 19th at Beaulieu, he used Pratt's spirit. The height attained was 1,120 ft., thus beating the officially recognised British record made by M. Paulhan of 975 ft. at Sandown Park. Mr. Drexel, writing of the Pratt's spirit used in making this record, remarks that "it gives every satisfaction," which is all that can be expected of any motor spirit.

## Kites and Model Aeroplanes.

A NEW edition of the very useful catalogue of model aeroplanes, fittings, and kites stocked by Messrs. Gamage has just been issued, and a copy should be secured by all interested in these two branches of sport. It includes particulars of the most successful models for which Messrs. Gamage have exclusive selling rights, while there are a couple of articles of great value to those who fly kites. One is on "Signalling by Means of Kites," by Lieut. H. E. Crocker, and the other is on "Aerial Photography," by Wallace Jones.

## More Hangars for Eastchurch.

A COUPLE of hangars are being erected by Harbrows for Mr. Samuel White and Mr. Jack Dare respectively at Eastchurch. The firm are also removing the Royal Aero Club's buildings, as well as Lieut. Dunne's hangar, from Shellbeach to Eastchurch.



## PUBLICATIONS RECEIVED.

*By Aeroplane to the Sun.* By Donald W. Horner. London: The Century Press, 6, Surrey Street, W.C. Price 6s.

*Model Balloons and Flying Machines.* By J. H. Alexander, M.B., A.I.E.E. London: Crosby Lockwood and Son. Price 3s. 6d. net.

*Extracts and Letters on Brooke Motors.* Lowestoft: J. W. Brooke and Co., Ltd.

## Catalogues.

*The World's Aviation Catalogue, 1910-11.* The Aerial Manufacturing Co. of Great Britain and Ireland, Ltd., 26, Shaftesbury Avenue, W.

*All About Kites and Model Aviation.* A. W. Gamage, Ltd., Holborn.

## NEW COMPANY REGISTERED.

**New Pelapone Engine Co., Ltd.**—Capital £7,500, in £1 shares. Builders of oil and other engines for aerial machines or other purposes, &c.

## Aeronautical Patents Published.

Applied for in 1909.

Published July 7th, 1910.

- 13,965. J. RICHARDS. Stability device for aeroplanes.  
14,434. E. T. WILLOWS. Airships, aeroplanes, &c.  
14,476. C. H. J. MACKENZIE-KENNEDY. Automatic balancing and steering.  
14,645. L. BOT AND E. LALLEMAND. Aerial navigation.  
16,367. F. W. DUFWA. Flying machines.  
17,201. H. D. BOULTREE. Aeroplanes, gliders, &c.  
18,982. A. E. DOWNING. Flying machines.  
22,386. F. D. HENDERSON. Monoplane.

Applied for in 1910.

Published July 7th, 1910.

- 14,443. F. W. DUFWA. Flying machines.  
16,694. F. W. DUFWA. Flying machines.  
8,750. G. GERALDSON. Starting and landing devices.

## DIARY OF FORTHCOMING EVENTS.

### British Events.

1910.  
July 9. Coventry A.C.S. Model Trials.  
July 11-16. Bournemouth.\*  
July 16. Kite and Models Competition. Kite and Model Aeroplane Assoc.  
July 23. Balloon Race, Hurlingham.  
July 28-Aug. 3. Blackpool.

1910.  
Aug. 6-13. Lanark.\*  
Aug. 15-20. Blackpool.  
Aug. 17-24. Southend.  
Aug. 24-27. Cardiff.  
Aug. 29-30. Dublin.  
Sept. 1-3. Folkestone.  
Sept. 8-10. Durham.

### Foreign Events.

1910.  
July 3-10. Rheims.\*  
July 24-Aug. 4. Belgium.\*  
Aug. 6-21. Circuit de l'Est (Matin).  
Aug. 25-Sept. 4. Havre-Trouville.\*  
Sept. 24-Oct. 3. Milan.\*  
Sept. 25-Oct. 3. Biarritz.

1910.  
Oct. 18-25. St. Louis. Gordon-Bennett Balloon Race.  
Oct. 25-Nov. 2. New York. Gordon-Bennett Aviation Cup.  
Dec. 4-18. Marseilles.

\* International.

## BACK NUMBERS OF "FLIGHT."

SEVERAL back numbers are now very scarce, and have been raised in price as follows:—

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6, Feb. 6,	"	"How Men Fly" ...	0	6
8, " 20,	"	Aeronautical Bibliography.		
		Wright Bros.' Elevator Patents.		
10, Mar. 6,	"	Flying Ground at Farnbridge	1	0
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		Human Side of Flying ...	1	0
		Aero Club Ground at Shellbeach.		
		Military Aeronautics.		
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